

STATE OF MICHIGAN  
BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

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In the matter of the application of	)	
<b>DTE ELECTRIC COMPANY</b> for approval of	)	
interconnection procedures and waivers from	)	Case No. U-21482
Interconnection and Distributed Generation	)	
Standards R 460.901a <i>et seq.</i>	)	
_____	)	

At the December 5, 2025 meeting of the Michigan Public Service Commission in Lansing, Michigan.

PRESENT: Hon. Daniel C. Scripps, Chair  
Hon. Katherine L. Peretick, Commissioner  
Hon. Shaquila Myers, Commissioner

**ORDER**

On April 24, 2023, the Commission issued an order in Case No. U-20890 adopting the Interconnection and Distributed Generation Standards (also known as the MIXDG rules). The MIXDG rules, which are codified at Mich Admin Code, R 460.901a *et seq.*, became effective on April 25, 2023. Included in the MIXDG rules is Mich Admin Code, R 460.920 (Rule 20), which lays out the requirements pertaining to interconnection procedures and forms and directs providers to file an application for approval of interconnection procedures and forms within 120 days of the effective date of the rules. *See*, Rule 20(1). Rule 20(2) provides that the Commission shall issue a final order approving, rejecting, or modifying the proposed interconnection procedures within 360 days of the submission of the application.

The May 18, 2023 order in Case No. U-21117 (May 18 order) directed the rate-regulated

electric utilities and member-regulated electric cooperatives, including DTE Electric Company (DTE Electric), to file draft interconnection procedures (IX procedures) in the Case No. U-21117 docket by June 16, 2023, and directed the Commission Staff (Staff) to hold a working session for interested persons on June 21, 2023, to allow for input regarding the draft IX procedures. The May 18 order required final IX procedures to be filed no later than August 23, 2023, per the requirements of Rule 20(1).

On August 23, 2023, DTE Electric filed an application for approval of final IX procedures, along with supporting testimony, exhibits, and requested rule waivers, in the instant docket. On September 28, 2023, the Commission issued an order in this docket (September 28 order) soliciting comments and reply comments on the proposed procedures and waiver requests. In response to the September 28 order, comments were filed by Ford Motor Company; Michigan Energy Innovation Business Council (MEIBC); Energy Michigan; the Staff; and the Environmental Law & Policy Center, Ecology Center, and Vote Solar (jointly). On November 13, 2023, DTE Electric filed reply comments.

On February 8, 2024, the Commission issued an order in Case Nos. U-21455 *et al.* (which included this docket) (February 8 order) addressing the changes to the statutory requirements for interconnection resulting from the passage of Public Act 235 of 2023 (Act 235). In the February 8 order, the Commission: (1) rejected DTE Electric's proposed IX procedures due to the statutory changes; (2) directed DTE Electric to file a new application for proposed IX procedures in this docket by March 22, 2024; (3) allowed for additional initial and reply comments to be filed in the instant docket no later than May 22 and June 5, 2024, respectively; (4) converted the instant docket to a contested proceeding; and (5) invited comments on a draft standard Level 1, 2, and 3 interconnection agreement in Case No. U-21543. In the February 8 order, the Commission also

acknowledged that the filing of new applications would restart the clock on the 360-calendar-day timeline required by Rule 20(2); and added that, per Rule 20(3), “[u]ntil the commission accepts, rejects, or modifies an electric utility’s interconnection procedures and forms, the electric utility may use the proposed interconnection procedures and forms when processing interconnection applications with the exception of fixed fees and fee caps.” February 8 order, p. 5 (quoting Rule 20(3)).

Notably, in the February 8 order, the Commission found that the comments filed in the instant docket in response to the September 28 order:

raise significant issues related to: (1) indemnity clauses in both the interconnection agreement and the construction agreement; (2) power limiting, export control, and inverters; (3) direct transfer trip; (4) fee adjustments; (5) additional studies that may be required for larger interconnections and related fees; and (6) battery storage. The Commission finds that DTE Electric’s reply comments do not address these issues in a manner that would allow for resolution of these concerns outside of a contested case.

February 8 order, p. 6. The Commission converted this docket to a contested case and indicated that it would read the record. *Id.*

On March 22, 2024, DTE Electric filed an application, with supporting testimony and exhibits, requesting approval of final IX procedures, forms, agreements, and waivers (application). On May 23, 2024, a prehearing conference was held before Administrative Law Judge Katherine E. Talbot (ALJ), where intervention was granted to the Ecology Center, Environmental Law & Policy Center, Union of Concerned Scientists, and Vote Solar (collectively, the Clean Energy Organizations or CEOs); MEIBC, Institute for Energy Innovation, and Advanced Energy United (collectively, MEIU); and Energy Michigan. DTE Electric and the Staff also participated in the proceeding.

On July 3, 2024, DTE Electric filed direct testimony and exhibits. On September 16, 2024,

the Staff, MEIU, and the CEOs filed direct testimony and exhibits. On October 7, 2024, the CEOs, MEIU, and DTE Electric filed rebuttal testimony.

On November 4, 2024, an evidentiary hearing was held before the ALJ, direct and rebuttal testimony were bound into the record, and cross-examination took place.

On December 16, 2024, initial briefs were filed by DTE Electric, the Staff, MEIU, and the CEOs. On January 13, 2025, reply briefs were filed by DTE Electric, MEIU, and the CEOs. On January 14, 2025, the case was transmitted to the Commission by the ALJ.

On March 10, 2025, Energy Michigan, MEIU, the CEOs, the Staff, and DTE Electric filed a joint motion to delay the issuance of the final order in the instant docket for 90 days in order to allow the continuation of settlement discussions (first motion). The parties noted that Mich Admin Code, R 792.10431(1) (Rule 431(1)) provides that parties are “encouraged to enter into settlements when possible[.]” First motion, p. 1 (quoting Rule 431(1)). The parties stated that they were discussing settlement, and that, in light of the complexity of this matter, they agreed that “an additional 90-days beyond March 17, 2025 would improve the likelihood that the parties can settle this case.” First motion, p. 2. On March 13, 2025, the Commission issued an order in this docket granting the first motion and extending the deadline for a final order to June 16, 2025.

On June 3, 2025, the parties filed a second joint motion to delay the issuance of the final order until August 21, 2025, in order to allow the continuation of settlement discussions (second motion), based on the same arguments put forward in the first motion. Second motion, pp. 1-2. On June 12, 2025, the Commission issued an order in this docket granting the second motion and extending the deadline for issuing a final order in this case until August 21, 2025.

On August 12, 2025, the parties filed a third joint motion to delay the issuance of the final order until December 3, 2025, in order to allow the continuation of settlement discussions (third

motion), based on the same arguments put forward in the first motion. Third motion, pp. 1-2. In the August 21, 2025 order in the instant docket, the Commission granted the third motion but instructed the parties that any settlement agreement filed after November 6, 2025, would not be considered by the Commission for approval pursuant to Mich Admin Code, R 792.10431(5).

On November 6, 2025, the parties filed a settlement agreement resolving all issues in the case. The final versions of the interconnection procedure documents are filed as attachments to the settlement agreement.

The Commission has reviewed the settlement agreement and attachments and finds that the public interest is adequately represented by the parties who entered into the settlement agreement. The Commission further finds that the settlement agreement is in the public interest, represents a fair and reasonable resolution of the proceeding, and should be approved.

THEREFORE, IT IS ORDERED that the settlement agreement, attached as Exhibit A, is approved.

The Commission reserves jurisdiction and may issue further orders as necessary.

Any party desiring to appeal this order must do so in the appropriate court within 30 days after issuance and notice of this order, pursuant to MCL 462.26. To comply with the Michigan Rules of Court's requirement to notify the Commission of an appeal, appellants shall send required notices to both the Commission's Executive Secretary and to the Commission's Legal Counsel. Electronic notifications should be sent to the Executive Secretary at [LARA-MPSC-Edockets@michigan.gov](mailto:LARA-MPSC-Edockets@michigan.gov) and to the Michigan Department of Attorney General - Public Service Division at [sheac1@michigan.gov](mailto:sheac1@michigan.gov). In lieu of electronic submissions, paper copies of such notifications may be sent to the Executive Secretary and the Attorney General - Public Service Division at 7109 W. Saginaw Hwy., Lansing, MI 48917.

MICHIGAN PUBLIC SERVICE COMMISSION

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Daniel C. Scripps, Chair

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Katherine L. Peretick, Commissioner

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Shaquila Myers, Commissioner

By its action of December 5, 2025.

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Lisa Felice, Executive Secretary

STATE OF MICHIGAN

BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

In the matter of the Application of	)	
<b>DTE ELECTRIC COMPANY</b>	)	
for approval of Interconnection Procedures	)	Case No. U-21482
and Waivers from Interconnection and Distributed	)	
<u>Generation Standards R 460.901a et. seq.</u>	)	

**STIPULATION AND SETTLEMENT AGREEMENT**

Pursuant to Section 78 of the Administrative Procedures Act of 1969 (“APA”), as amended, MCL 24.278, and Rule 431 R 792.10431 of the Rules of Practice and Procedure Before the Michigan Public Service Commission R 792.10401 et. seq. (“MPSC” or “Commission”), the undersigned parties agree as follows:

1. This Stipulation and Settlement Agreement ("Settlement Agreement") between and among DTE Electric Company (“DTE”), the Michigan Public Service Commission Staff (“Staff”), Michigan Energy Innovation Business Council, the Institute for Energy Innovation and Advanced Energy United (collectively, “MEIU”), the Ecology Center, the Environmental Law and Policy Center (“ELPC”), the Union of Concerned Scientists (“UCS”), and Vote Solar (collectively the Clean Energy Organizations (“CEO”)), and Energy Michigan (individually “Party”; collectively, “the Parties”) is intended by the Parties as a full and final settlement and satisfaction of all issues before the Commission related to this proceeding by all of the Parties, consistent with the encouragement to enter into settlements found in the Rules of Practice and Procedure Before the Commission. (See R 792.10431(1))

2. Following a comment process on DTE Electric’s interconnection procedures

originally filed on August 23, 2023, the Commission ordered commencement of this contested case proceeding under Rule 20(2). (Case No. U-21455 et. al. Order dated February 8, 2024, p. 6)

3. On May 23, 2024, a Prehearing was held in this proceeding, and a schedule was established. The Company accomplished appropriate notice consistent with the Executive Secretary's direction. (1T 4-6) At the appointed times, the Company filed the Direct and Rebuttal Testimony of Richard J. Mueller. Mr. Mueller's testimony is reported at 2T 32-164. He also sponsored Exhibit A-1 *Interconnection Procedures Levels 1 & 2 Projects*, Exhibit A-2 *Interconnection Procedures Levels 3, 4, & 5 Projects*, and Exhibit A-3 *Shared Documents Levels 1,2,3,4 & 5 Projects*. Staff sponsored the Direct and Rebuttal Testimony of Julie K. Baldwin (2T 349-359; sponsoring Exhibit S-1 and S-2) and Cody S. Matthews (2T 359-375; sponsoring Exhibit S-3.1). MIEU sponsored the Direct and Rebuttal Testimony of Dr. Laura S. Sherman (2T 165-256; sponsoring Exhibits MIEU-1 through MIEU-5). CEO sponsored the Direct and Rebuttal Testimony of Lee Shaver (2T 257-346; sponsoring Exhibits CEO-1 through CEO-9). Exhibits CEO-10 through CEO-28 were also admitted. (2T 347-349) Energy Michigan did not submit evidence in the proceeding.

4. On November 4, 2024, the evidentiary hearing was conducted in this proceeding. Initial Briefs were filed at the appointed time by DTE Electric, Staff, MEIU and CEO. DTE Electric, MEIU, and CEO filed Reply Briefs.

5. On March 13, 2025, June 12, 2025, and August 21, 2025, the Commission granted Joint Motions of the Parties to Delay Issuance of Order for Settlement Discussions. In an attempt to efficiently resolve the matter, the Parties have agreed to enter into a full settlement

of this case and recommend approval by the Commission of the following items set forth in Attachments A and B.

6. The Parties request that the Commission enter an order (i) finding that the settlement agreement is in the public interest and represents a fair and reasonable resolution of the proceeding, (ii) approving the terms and conditions set forth in Attachment A, which provides nineteen (19) settlement terms, and (iii) approving Attachment B, which are DTE Electric's Interconnection Procedures and related documents set forth in Exhibits A-1, A-2, and A-3 in this proceeding, modified to be consistent with the settlement terms set forth in Attachment A.

7. This Settlement Agreement is entered into for the sole and express purpose of reaching a compromise among the Parties. All offers of settlement and discussions relating to this Settlement Agreement are considered privileged under MRE 408. If the Commission approves this Settlement Agreement without modification, neither the Parties to this Settlement Agreement nor the Commission shall make any reference to, or use this Settlement Agreement or the Order approving it, as a reason, authority, rationale, or example for taking any action or position or making any subsequent decision in any other case or proceeding; provided however, such references may be made to enforce or implement the terms of the Settlement Agreement and the Commission Order approving it. No Party shall appeal a Commission Order approving this Settlement Agreement without modification.

8. This Settlement Agreement is not severable. Each provision of this Settlement Agreement is dependent upon all other provisions of this Settlement Agreement. Failure to comply with any provision of this Settlement Agreement constitutes failure to comply with the

entire Settlement Agreement. If the Commission rejects or modifies this Settlement Agreement, this Settlement Agreement shall be deemed to be withdrawn, and shall not constitute any part of the record in this proceeding or be used for any other purpose and shall not operate to prejudice the pre-negotiation positions of any Party.

9. This Settlement Agreement will reduce the time and expense of the Commission, its Staff, and the Parties.

10. The Parties agree to waive Section 81 of 1969 PA 306, MCL 24.281, as it applies to the issues in this proceeding, if the Commission approves this Settlement Agreement without modification.

11. This Settlement Agreement may be executed in any number of counterparts, each considered an original, and all counterparts that are executed shall have the same effect as if they were the same instrument.

**IN WITNESS WHEREOF**, the Parties have caused this Settlement Agreement to be duly executed by their respective duly authorized officers as of the date first written below.

Respectfully submitted,

[SIGNATURE PAGES]

**MICHIGAN ENERGY INNOVATION  
BUSINESS COUNCIL, THE INSTITUTE FOR  
ENERGY INNOVATION and Advanced  
ENERGY UNITED (collectively “MEIU”)**

Dated: November 6, 2025

**Justin K.  
Ooms**

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**ENERGY MICHIGAN**

Dated: November 6, 2025

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**THE ECOLOGY CENTER, THE  
ENVIRONMENTAL LAW & POLICY  
CENTER (“ELPC”), THE UNION OF  
CONCERNED SCIENTISTS (“UCS”) and  
VOTE SOLAR (collectively the Clean Energy  
Organizations “CEO”)**

Dated: November 6, 2025



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**MICHIGAN PUBLIC SERVICE  
COMMISSION STAFF**

Dated: November 6, 2025



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Dated: November 6, 2025

**DTE ELECTRIC COMPANY**

**Jon P.**

**Christinidis**

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# **Attachment A**

## Attachment A

### Case No. U-21482 DTE Electric Interconnection Procedures Settlement Terms

1. **Level 1 and 2 Interconnection Procedures:** The Company will make changes to DTE Electric Interconnection Procedures Exhibit A-1 consistent with the recommendations proposed by Staff Witness Baldwin in Exhibit S-1 including, as described in paragraphs 3 and 4 below, recommendations 4 and 7.
2. **Level 3, 4, and 5 Interconnection Procedures:** The Company will make changes to the DTE Electric Interconnection Procedures in Exhibit A-2 consistent with the recommendations proposed by Staff Witness Baldwin in Exhibit S-2, including recommendation 3 and, as described in paragraphs 3 and 4 below, recommendations 4 and 7.
3. **Modification of the interconnection applications:** See R460.982 for the material modification process after the application is considered accepted but before the interconnection agreement is executed. All information must be submitted through PowerClerk and DTE Electric will update the project status in PowerClerk at each process step or change.
4. **Modification to the DER:** See R460.984 for the material modification process after the interconnection agreement is executed. All information must be submitted through PowerClerk and DTE Electric will update the project status in PowerClerk at each process step or change.
5. **Unintentional Islanding:** DTE Electric will revise its interconnection procedures to include the following for assessing when supplemental anti-islanding protections (such as, but not limited to, direct transfer trip) are required:
  - a. For study track projects the requirements for supplemental anti islanding functions or equipment will be determined during the relay protection review in the system impact study.
  - b. For fast track projects, projects will be screened as follows:
    - i. For synchronous and induction type projects at Levels 3 - 5, DTE Electric will determine whether the total generation within a protective zone is greater than 33% of the minimum utility load that could be isolated along with the generation. In cases where it can be shown that self-excitation of the induction generator cannot occur when isolated from the DTE Electric system, DTE Electric may waive the requirement.

- ii. For inverter-type Projects at all Levels, DTE Electric will determine whether the total generation within a protective zone is greater than two thirds of the minimum utility load that could be isolated along with the generation or whether synchronous generation accounts for greater than 25% of the inverter-based supply.
- iii. For all levels, if a project fails either (i) or (ii) under (b) (as applicable), DTE Electric will conduct a risk of islanding study as a supplemental study. The interconnection procedures will describe this study and include timing and cost for this study. Projects which fail the risk of islanding study may be required to install methods to mitigate this risk. Acceptable methods include, but are not limited to, supplementing existing island detection methods with relays; site-specific, customized solutions; and communication-based methods including DTT. All acceptable methods will be described in the interconnection procedures.

6. **Applicability of IEEE 2800:** The Company currently owns equipment at the following voltages that may require the application of certain IEEE 2800 clauses for inverter-based resources (IBRs):

- Distribution (4.8 kV, 8.3kV and 13.2kV)
- Subtransmission (24 kV, 34.5kV and 40kV)
- High voltage radial lines (typically 120kV, but includes 100 kV or above)

IEEE 2800 shall be applied to projects connected at the transmission level. For Sub-transmission connected projects, IEEE 2800 shall apply with the exception of 4.1 and 4.2 with references to Transmission System Operator (TSO) being replaced with Electric Distribution Company (EDC).

Following the System Impact Study, for projects connected to the distribution system that are determined to have an impact on the transmission system, subtransmission system, or high voltage radial lines, the following subset of the IEEE 2800 clauses shall be applied: 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 4.9, 4.10, 4.12, 10, with references to Transmission System Operator (TSO) being replaced with Electric Distribution Company (EDC).

IEEE 2800 Clause 10 includes requirements for verified IBR plant-level models, documentation detailing development process and verification of these models, and documentation with brief explanation of control strategy. This information shall be provided as part of the Interconnection Application prior to study, or when DTE has determined that a proposed modification is a material modification. After

interconnection and/or upon request from the utility, the applicant shall provide within 90 days either updated models or verification that there has been no change to previously submitted models.

For distribution-connected projects applicable IEEE 2800 requirements may be satisfied as follows: For projects utilizing a single inverter, the inverter shall be certified as defined in the procedures and implement settings as provided by DTE, and such certification shall be considered sufficient for meeting the applicable IEEE 2800 clauses. If multiple inverters are configured as a plant, the individual inverters shall be certified as defined in the procedures and implement settings as provided by DTE, and the overall plant shall meet the applicable IEEE 2800 clauses.

**7. Limited Export DERs and Inadvertent Export:** The Company will modify the DTE Electric Interconnection Procedures to accomplish the following:

To be eligible for the Fast Track, projects with export-limiting functionality enabled utilizing either certified inverters with PCS or a standalone PCS shall be screened as set forth below. Projects which fail any of the below screens will be subject to supplemental review or study. Any such studies will take into account the inverter's actual open loop response time (to the extent ascertainable) and will not assume an open loop response time of 30 seconds unless no actual response time can be determined.

- For all projects, inadvertent export shall be limited to no more than 30 seconds, as required for certification.
- For the purposes of the below “shared infrastructure” and “dedicated infrastructure” screens, “inadvertent-export-susceptible capacity” for a given DER shall mean the maximum electric capacity which a DER may introduce to the distribution system during an inadvertent export event, which may differ from either the nameplate or the inverter rating, depending on the configuration. The inadvertent-export-susceptible capacity of any DER employing relays to prevent inadvertent export shall be deemed to be zero.
  - Shared infrastructure screens:
    - For projects with an inadvertent-export-susceptible capacity of up to 20 kWac, the aggregate inadvertent-export-susceptible capacity of the proposed project, plus the existing aggregate inadvertent export-susceptible capacity of DERs interconnected on shared infrastructure,



**8. Changes to Screens:** DTE will update the screens as indicated below:

- a. Fast Track Screen ii – line section peak load screen: DTE Electric will revise this screen to the following language: “For interconnection of a proposed DER to a radial distribution circuit, the aggregated export capacity, including the proposed DER, on the circuit may not exceed 15% of the line section annual peak load as most recently measured or calculated if measured data is not available. A line section is that portion DTE’s distribution system connected to a customer bounded by automatic sectionalizing devices or the end of the distribution line. The electric utility shall consider 100% of applicable loading, if available, instead of 15% of line section peak load for level 1 and 2 DER. This screen does not apply to level 1 non-export and level 2 non-export DER applications.”
- b. Fast Track Screen iii – network protectors screen: DTE will maintain the screen as written in the procedures, which is consistent with the MIXDG rules.
- c. Fast Track Screen iv – fault current screen: DTE will revise the screen to the following language: “The proposed DER, in aggregation with other DERs on the distribution circuit, may not contribute more than 10% to the distribution circuit’s maximum fault current at the point on the primary voltage nearest the proposed point of common coupling, based on nameplate rating. This screen does not apply to level 1 applications except in situations where the addition of the DER would render the protection scheme inoperable or require it to be modified to be able to continue to operate as designed.”
- d. Fast Track Screen v – short circuit screen: DTE will revise the screen to the following language: “The proposed DER, in aggregate with other DERs on the distribution circuit, may not cause any distribution protective devices and equipment or interconnection customer equipment on the system to exceed 87.5% of the short circuit interrupting capability, based on nameplate rating. An interconnection may not be proposed for a circuit that already exceeds 87.5% of the short circuit interrupting capability. Distribution protective devices and equipment include, but are not limited to, substation breakers, fuse cutouts, and line reclosers. This screen does not apply to level 1 applications except in situations where the addition of the DER would require the interrupting equipment to be modified to not improperly operate.”
- e. Fast Track Screen vii – shared secondary screen: DTE will revise the screen to the following language: “If the proposed DER is to be interconnected on single-phase shared secondary, the aggregate export capacity on the shared

secondary, including the proposed DER export capacity, may not exceed 20 kWac or 65% of the transformer nameplate rating.

- f. Fast Track New Screen – Eliminate screen xi.
  - g. Fast Track Screen xii – DTE will revise the screen to the following language:  
“The aggregate DER export capacity on the line section plus the proposed DER export capacity, subject to inadvertent export screens, shall not exceed the day to day thermal limit of any distribution system component that serves the project or in any case exceed the rated fault current limit of DTE equipment.”
  - h. Supplemental Review Screen iii – DTE Electric will revise the language to refer to day-to-day thermal rating.
9. **Energy Storage and the Distributed Generation Program:** The interconnection procedures will include discussion of the eligibility and the allowed configurations of and requirements for energy storage combined with distributed generation projects under Riders 16 and 18.
- a. General Tariff Eligibility Provisions:
    - i. When determining eligibility for Rider 16, DTE Electric will not include the kWh contribution from an energy storage device for purposes of the “Base Rate self-service needs” limitation in Section B(2) of the Eligible Electric Generating Units provision of Rider 16, and DTE will not include the export or nameplate capacity of an energy storage device for purposes of the AC system size limitations under Section B(1) of the Eligible Electric Generating Units provision of Rider 16. The addition of energy storage shall not be permitted to cause any increase in the total number of kWh a customer's DER is capable of generating and/or exporting to the grid on an annual basis.
    - ii. When determining eligibility for Rider 18 (and any successor tariffs subject to the requirements of MCL 460.1173), DTE Electric will not include the kWh contribution from an energy storage device for purposes of the 110% limitation in MCL 460.1173(2) or the export or nameplate capacity of an energy storage device for purposes of applying the DG program capacity allocations in MCL 460.1173(3)(a) and (b).
    - iii. Sections 8(a)(i) and 8(a)(ii) above apply regardless of whether an energy storage device and distributed generator utilize the same inverter (DC coupled) or separate inverters (AC coupled).

- iv. For level 3 and above projects a third party testing report is required to validate settings and functionality during the commissioning phase, similar to how a relay report is required when relay protection is utilized.
- b. Battery Energy Storage System Modes. The allowable battery energy storage system modes are the following:
- i. Import-only
  - ii. Export-only
  - iii. No-exchange

A customer shall specify the battery energy storage system mode in the interconnection application. Any future change to the battery energy storage system mode shall require a new program application.

- c. Technical requirements for eligibility for Riders 16 and 18 in Import-Only Mode:
- i. A battery energy storage system shall be physically configured and set to operate in an import only mode (or its substantial equivalent) according to manufacturer instructions. For the purposes of this paragraph, “import only mode (or its substantial equivalent)” means a system configuration that is designed to ensure that the battery does not send energy back to the grid.
  - ii. The battery energy storage system shall be configured with sensors capable of isolating the input and output of the battery energy storage system exclusive of any loads or generation on the customer’s site to determine if, at any single point in time, the battery energy storage system is charging or discharging.
  - iii. A sensor shall be installed on the service entrance conductors between the utility meter and the customer’s main service panel that measures the total inflow and outflow at the customer’s service and is interfaced with the battery energy storage system’s control system.
  - iv. The battery energy storage system’s control system shall be capable of receiving the inputs from the sensors described in Sections 9.c.ii. and iii. above. In any case that the relevant sensors detect that the battery energy storage system is discharging and that the net flow at the point of service is zero or is flowing out to the grid, the battery

energy storage system shall reduce discharge or cease discharging immediately to ensure no battery energy is exported to the grid.

- v. The battery energy storage system shall comply with any other limits applicable to the terms of its interconnection.
  - vi. For AC-coupled battery energy storage systems, the sensors required by Section 9.c.ii. and iii. above shall be placed (a) at the battery energy storage system AC terminals, (b) at the terminals of generating inverters and (c) at the point of service.
  - vii. For DC-coupled battery energy storage systems that are combined with generation, the sensors required by Section 9.c.ii. and iii. above shall be placed (a) at the AC terminals of the shared inverter and (b) at the point of service.
  - viii. Sensor placement, phasing, and direction, make and model of sensors or other power control system equipment shall be clearly labelled on one lines and three lines (as applicable), indicating exactly where each measurement is taking place and how it is communicated to the battery energy storage system's control system. To the extent that any sensor required by Section 9.c.ii. (as further defined in Sections 9.c.vi and vii) is internal to an inverter or control system, it shall be sufficient to state on the one lines and three lines (as applicable) and provide the applicable manufacturer wiring diagram showing such measurement points.
  - ix. Photographs of the battery energy storage system, associated equipment and measurement points will be required during construction to ensure proper system installation and alignment to the approved application.
- d. Technical requirements for eligibility for Riders 16 and 18 in Export-Only Mode:
- i. A battery energy storage system shall be physically configured and set to operate in an export only mode (or its substantial equivalent) according to manufacturer instructions. For the purposes of this paragraph, "export only mode (or its substantial equivalent)" means a system configuration that is designed to ensure that the battery does not charge from the grid.
  - ii. The battery energy storage system shall be configured with sensors capable of isolating the input and output of the battery energy storage system exclusive of any loads or generation on the customer's site to

determine if, at any single point in time, the battery energy storage is charging or discharging.

- iii. A sensor shall be installed on the service entrance conductors between the utility meter and the customer's main service panel that measures the total inflow and outflow at the customer's service and is interfaced with the battery energy storage system's control system.
- iv. The battery energy storage system's control system shall be capable of receiving the inputs from the sensors described in Sections 9.d.ii. and iii. above. In any case that the relevant sensors detect that the battery energy storage system is charging and that the net flow at the point of service is zero or is flowing in from the grid, the battery energy storage system shall reduce charging or cease charging immediately to ensure no grid energy is used to charge the battery energy storage system.
- v. The battery energy storage system shall comply with any other limits applicable to the terms of its interconnection.
- vi. For AC-coupled energy storage systems, the sensors required by Section 9.d.ii. and iii. above shall be placed (a) at the battery energy storage system AC terminals, and (b) at the terminals of generating inverters, and (c) at the point of service.
- vii. For DC-coupled battery energy storage systems that are combined with generation, the sensors required by Section 9.d.ii. and iii. above shall be placed (a) at the AC terminals of the shared inverter and (b) at the point of service.
- viii. Sensor placement, phasing, and direction, make and model of sensors or other power control system equipment shall be clearly labelled on one lines and three lines (as applicable), indicating exactly where each measurement is taking place and how it is communicated to the battery energy storage system's control system. To the extent that any sensor required by Section 9.c.ii. (as further defined in Sections 9.d.vi. and vii.) is internal to an inverter or control system, it shall be sufficient to state on the one lines or three lines (as applicable) and provide the applicable manufacturer wiring diagram showing such measurement points.
- ix. Photographs of the battery energy storage system, associated equipment and measurement points will be required during construction to ensure proper system installation and alignment to the approved application.

- e. Technical requirements for eligibility for Riders 16 and 18 in No-Exchange Mode:
- i. A battery energy storage system shall be physically configured and set to operate in a no-exchange mode (or its substantial equivalent) according to manufacturer instructions. For the purposes of this paragraph, “no-exchange mode (or its substantial equivalent)” means a system configuration that is designed to ensure that the battery does not charge from the grid or discharge to the grid.
  - ii. The battery energy storage system shall be configured with sensors capable of isolating the input and output of the battery energy storage system exclusive of any loads or generation on the customer’s site to determine if, at any single point in time, the battery energy storage system is charging or discharging.
  - iii. A sensor shall be installed on the service entrance conductors between the utility meter and the customer’s main service panel that measures the total inflow and outflow at the customer’s service and is interfaced with the battery energy storage system’s control system.
  - iv. The battery energy storage system’s control system shall be capable of receiving the inputs from the sensors described in Sections 9.e.ii. and iii. above. In any case that the relevant sensors detect (a) that the battery energy storage system is charging and the net flow at the point of service zero or is flowing in from the grid or (b) that the battery energy storage system is discharging and that the net flow at the point of services is zero or flowing out to the grid, the battery energy storage system shall reduce charging or discharging or cease operating (in each case as applicable) to ensure that no battery energy is exported to the grid or that no grid energy is used to charge the battery energy storage system (as applicable).
  - v. The battery energy storage system shall comply with any other limits applicable to the terms of its interconnection.
  - vi. For AC-coupled energy storage systems, the sensors required by Section 9.e.ii. and iii. above shall be placed (a) at the battery energy storage system AC terminals, (b) at the terminals of generating inverters, and (c) at the point of service.
  - vii. For DC-coupled energy storage systems that are combined with generation, the sensors required by Section 9.e.ii. and iii. above shall be placed (a) at the AC terminals of the shared inverter and (b) at the point of service.

- viii. Sensor placement, phasing, and direction, make and model of sensors or other power control system equipment shall be clearly labelled on one lines and three lines (as applicable) indicating exactly where the measurement is taking place and how it is communicated to the battery energy storage system's control system. To the extent that any sensor required by Section 9.e.ii. (as further defined in Section 9.e.vi. and vii.) is internal to an inverter or control system, it shall be sufficient to tstate on the one lines and three lines (as applicable) and provide the applicable manufacturer wiring diagram showing such measurement points.
  - ix. Photographs of the battery energy storage system, associated equipment and measurement points will be required during construction to ensure proper system installation and alignment to the approved application.
- f. Adding Battery Storage to an Existing System:
- i. For customers grandfathered under Rider 16, so long as the total amount of energy that the system is capable of generating annually does not change, energy storage may be added in one of the three situations described below, and subject to all preceding provisions under Section 9. In addition, the Company shall update its procedures to explicitly allow the following situations on a new interconnection application for an existing system to be evaluated without a customer's losing their access to Rider 16 or Rider 18:
    - 1. Adding a new inverter with storage only, with appropriate metering, controls and settings to meet the requirements of 9(c), (d) or (e) (as applicable) for the site without any other modifications to the existing system.
    - 2. Replacing the existing inverter with a new one that supports the storage as long as the total generation does not change and the total export capacity does not change, and the maximum nameplate export does not change, with no other modifications to the existing system.
    - 3. Adding storage to an existing inverter that supports storage connections with no other modifications to the existing system, with appropriate metering, controls and settings to meet the requirements of 9(c), (d) or (e) (as applicable) for the site.

10. **Distributed Generation Project Size Determination:** For program purposes: DTE Electric will incorporate the effects of panel orientation and customer roof angle, as calculated within PowerClerk, when determining the expected annual kWh production of the project to determine DG program eligibility.
11. **Interconnection Review:** DTE will revise its procedures to provide that it will screen and study an interconnection application based on the export capacity of a DER, which may be limited using methods described in R 460.980(4). DTE may also provide for additional export limiting methods in its procedures. Certain exceptions may apply in specific situations which will be detailed in the procedures. Such exceptions include the use of inadvertent-export-susceptible capacity in the inadvertent export screens, and the use of the full nameplate capacity for screens evaluating short circuit and fault currents. Notwithstanding the foregoing, where full nameplate capacity is used, it shall be based on the nameplate AC rating of the inverter(s) or the nameplate capacity of the generation and storage, whichever is lesser.
12. **Interconnection Study Fees:** DTE Electric will receive a 2-year waiver to charge applicants actual costs for interconnection study fees except for distributed generation program study fees, which will be as set forth in R 460.926. The Commission will determine whether the waiver should be extended pursuant to R460.910.
13. **Indemnification:** DTE will adopt the mutual indemnification language approved by the Commission for the Standard level 1, 2, and 3 interconnection agreement in Case No. U-21543 on July 23, 2024, for all interconnection-related agreements (including construction agreements).
14. **Public Interconnection List:** DTE Electric agrees to the following, to be completed during the first update to the list following acceptance of this settlement agreement by the Commission:
  - a. Revise the interconnection list to include the township for each project in which the proposed point of common coupling will be located (on a going forward basis only).
  - b. Revise the interconnection list to include the labels, names, or identifiers of the distribution circuit and substation for each project.
  - c. Update the public interconnection list on a monthly basis.
  - d. Include the date of the last revision on the public interconnection list.

- e. Provide the updated, sortable public interconnection list in a spreadsheet format that can be viewed and downloaded from DTE Electric's website without the need to request the file.

**15. Interconnection Cost Allocation:** DTE Electric shall participate in technical interconnection meetings convened by the Michigan Public Service Commission Staff with Michigan utilities and interested parties. Cost allocation will be the topic of the technical interconnection work group meeting or meetings following the Commission order in this docket. When additional meetings dedicated to cost allocation are needed to accommodate utility, industry, and expert presentations as well as in-depth discussions, DTE Electric shall participate in those additional meetings. As part of these meetings, all Michigan utilities and stakeholders will be allowed to request germane information from all participants to advance the working group's discussions. (Such information may be provided under a non-disclosure agreement). The Staff will produce a final working group report to the Commission summarizing both consensus and non-consensus positions on cost allocation and will file the report in an industry-wide docket.

**16. Insurance:** DTE will revise its interconnection procedures to comply with the insurance provisions in R 460.986 (3), (4), and (5) for level 3, 4, and 5 projects.

**17. Fast Track Eligibility and Level Determination:** DTE Electric will revise its proposed procedures to the following:

- i. DTE will aggregate all proposed generation and storage on a site in determining project level and fast track eligibility.
- ii. DTE may conduct a review to determine if proposed changes constitute a material modification (as defined in the procedures) to existing generation. If so, DTE may include existing generation and storage on a site when aggregating generation to determine project level and fast track eligibility.
- iii. For inverter-based DERs, capacity for determining the project Level and fast track eligibility shall be based on the nameplate AC rating of the inverter(s) or the nameplate capacity of the generation and storage, whichever is lesser.

**18. RTU requirements:** DTE agrees to modify the language on page 38 of the procedures to clarify that RTU is required for level 5 projects. An RTU may be required for level 3 and 4 projects following a system impact study, facilities study, or supplemental study. If the study indicates that the project export capacity exceeds 50% of the annual peak feeder load, or DTT or other remote relaying is required, then an RTU is required.

**19. Disconnection:** After interconnection, where DTE Electric finds that there are grounds to believe that a DER is operating outside the terms of the interconnection

agreement, and DTE Electric determines that immediate disconnection is not warranted, DTE Electric will upon discovery of the grounds promptly inform the interconnection customer or its agent of this finding and the interconnection customer will be responsible for bringing the DER into compliance within 30 business days or a mutually agreed-upon time period, consistent with R 460.976 Rule 76. For the avoidance of doubt, the Parties agree that the following types of Project non-compliance shall result in prompt disconnection of a Project under R 460.978 Rule 78:

- a. Interconnecting a Project prior to approval from DTE Electric;
- b. After interconnection and without DTE's prior written approval, changing settings on the power control system for the Project from those specified in the Interconnection Agreement; or
- c. After interconnection and without DTE's prior written approval, adding generation or storage (for example, an additional solar panel or panels) in addition to the generation or storage specified in the Interconnection Agreement.

After disconnection pursuant to (a), (b), or (c), a Project must submit a new Application, pay all accompanying costs, and restart the interconnection process prior to potential future project interconnection and authorization to operate in parallel with the DTE Electric system.

# **Attachment B**

**DTE Electric**

**MICHIGAN ELECTRIC UTILITY**

**Generator Interconnection**

**Procedures**

**Level 1 and 2 Projects**

**with Certified DER Capacity  
Less Than 150 kWac**

*November 6, 2025*

# INTRODUCTION

## Level 1, 2

This Generator Interconnection Procedure document outlines the process & requirements used to install or modify generation projects with Certified DER Capacity ratings less than or equal to 150 kWac (nameplate) designed to operate in parallel with the DTE Electric Company (DTE or the Company) electric system. Technical requirements (data, equipment, relaying, telemetry, metering) are defined according to generation type, location of the interconnection, and mode of operation (Export or Non-Export). The process is designed to provide an expeditious interconnection to the DTE electric system that is both safe and reliable.

This document has been filed with the Michigan Public Service Commission (MPSC) and complies with rules established for the interconnection of parallel generation to the DTE electric system in the MPSC Order in Case No. U-20890.

The term "Project" will be used throughout this document to refer to electric generating equipment and associated facilities that are not owned or operated by DTE. The term "Applicant" means a person or entity submitting an interconnection application, a legacy net metering program application, or a distributed generation program application. An applicant is not required to be an existing customer of an electric utility. An electric utility is considered an applicant when it submits an interconnection application for a DER that is not a temporary DER.

This document does not address other Project concerns such as environmental permitting, local ordinances, or fuel supply. Nor does it address agreements that may be required with DTE and/or the transmission provider, or state or federal licensing, to market the Project's energy. An interconnection request does not constitute a request for transmission service.

It may be possible for DTE to adjust the requirements stated herein on a case-by-case basis. The review necessary to support such adjustments, however, may be extensive and may exceed the costs and timeframes established by the MPSC and addressed in these procedures. Therefore, if requested by the Applicant, adjustments to these procedures will only be considered if the Applicant agrees in advance to compensate DTE for the added costs of the necessary additional reviews and to also allow DTE additional time for the additional reviews.

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# INTERCONNECTION PROCEDURES

## 1. INTERCONNECTION PROCESS

### 1.1 Customer Project Planning Phase

An Applicant may contact DTE before or during the application process regarding the project. DTE can be reached by phone, e-mail, or by the external website to access information, forms, rates, and agreements.

*An interconnection process flow diagram can be found in Appendix A.*

Interconnection fees can be found in **Appendix B**. Procedure definitions can be found in **Appendix C**.

### 1.2 Pre-Application Report

An Applicant shall submit a completed pre-application report form (**Appendix J**) only if they desire to do so for level 1 or 2, it is not required or recommended. Full details of the pre application report are included in **Appendix M**.

### 1.3 Application Review & Track Assignment

The Applicant must first submit an Interconnection Application (**Appendix D**) to DTE. A separate application is required for each Project, or Project site and for any subsequent changes to a site after approval, if such changes are deemed a material modification after a material modification review under Section 1.13. If a single Project contains multiple types of DER, include all DER in a single application form. Applications may require additional information necessary to comply with MISO reliability and modelling requirements as applicable. An Applicant shall complete a submittal of the required interconnection application and interconnection filing fee per the table in **Appendix B**.

Documentation of site control must be submitted with the application by the Applicant. For level 1 and 2 DERs, site control may be demonstrated by providing documentation that shows any of the following:

- For level 1 or 2 DERs, proof of site control may be demonstrated by the site owner's signature and contact information on the application.

Otherwise:

- Ownership of, a leasehold interest in, or a right to develop a site for the purpose of constructing and operating the DER.
- An enforceable option to purchase or acquire a leasehold site for this purpose.
- A legally binding agreement transferring a present real property right to specified real property along with the right to construct and operate a DER on the specified real property for a period of time not less than 5 years.

In addition to the DER Capacity of the site, an Applicant is required to provide the desired export capacity in the application if it is less than the DER Capacity. Export capacity for a Project shall be defined using one of the accepted power limiting methods found in the interconnection technical requirements section.

DTE will aggregate all proposed generation and storage on a site in determining project level. If there is existing DER at the site, DTE may conduct a review to determine if proposed changes constitute a material modification (as defined in the Material Modification procedures) to existing generation. If so, DTE may include existing generation and storage on a site when aggregating generation to determine project level. For inverter-based DERs, capacity for determining the project Level shall be based on the lesser of either the total nameplate capacity of generation and storage equipment connected to the inverter(s) or the nameplate AC rating of the inverter(s).

Within 10 business days of receipt of the completed application and Interconnection application payment. DTE will notify the Applicant if the Interconnection Application is conforming, incomplete or non-conforming. If any portion of the Interconnection Application, data submittal (site plan and one-line diagrams, etc), or filing fee is incomplete and/or missing; DTE will provide a written list of all deficiencies to the Applicant with explanations via PowerClerk. The Applicant shall provide a modified application within 60 business days from the date the Applicant was notified by DTE that the application was incomplete, with up to 2 resubmissions permitted during this time period to resolve the deficiencies. After each submission of information, DTE will notify the Applicant within 10 business days that the interconnection application is either accepted, or rejected due to continuing deficiencies. If the Applicant does not meet the timelines required, the application may be withdrawn by DTE. Once DTE has accepted the application, DTE will notify the Applicant that the application is complete and accepted, and whether the Project will be processed following the non-export track, fast track, or study track. The applicant may indicate on the application that they wish to proceed directly to non-export or study track.

For projects applying for interconnection and applying for participation in a specific Tariff or market program, additional procedures and requirements may be required in addition to these procedures which will be present in program or tariff specific procedures.

## **1.4 Equipment Certification**

Projects proposing to use non-certified equipment shall use the level 3,4,5 procedures. The procedures in this document are not applicable to non-certified projects.

To expedite processing, specific inverter models that appear on the current California Energy Commission's list for certified equipment (<https://www.energy.ca.gov/programs-and-topics/programs/solar-equipment-lists>) will be considered certified.

Proposing the use of an inverter that is not on the CEC list requires the submission in the application of the appropriate UL1741 certification document for the current active supplement version that matches the exact model being utilized and additional supporting information to accurately represent the inverter in the application. Failure to produce the UL certification or discrepancies in the documentation may result in the application being placed on hold while DTE reviews the provided documentation.

## **1.5 Non-Export Track**

The fast track will be appropriate for most Level 1 and Level 2 projects. However, the non-export track is available to all projects that will not inject electric energy into the distribution system or create inadvertent export and that have an existing electrical service at the applicant's premise. In order to be eligible for the non-export study process the Project is required to submit a three line protection drawing and propose to install reverse power flow

(32) relaying or other method acceptable to DTE together with any other protection function, communication or control as determined by DTE for the safety of customers, and the reliable operation of the electrical system as defined within these interconnection procedures technical requirements. Within 20 business days of providing notice of an approved application, DTE will perform a study using the initial review screens in **Appendix H** to determine the suitability of the interconnection equipment for the non-export track and provide the results to the Applicant.

If the results indicate that no interconnection facilities, distribution upgrades, further study, or Project modifications are required, DTE will provide specifications within 20 business days for any equipment required to be installed by the Applicant. DTE may provide required coordination with the utility, settings for the installed protective equipment, inverters or other devices that need to be configured and validated prior to commissioning. DTE reserves the right to revise those settings as needed. Within 10 business days of receiving the equipment specifications, the Applicant shall notify DTE whether it will proceed to an Interconnection and Operating Agreement or will withdraw the application. The failure of the Applicant to notify DTE within the required time period shall result in the application being withdrawn.

If the results indicate further study is required, DTE will present options and the Applicant shall decide whether to proceed to a supplemental review under the fast-track process, the study track, facilities study, or to withdraw the application. The Applicant shall have 10 business days to decide on a course of action and notify DTE, otherwise the application may be withdrawn.

If a Project modification is offered by DTE, the Applicant shall either withdraw the interconnection application or provide a modified application within 60 business days from the date the Applicant was notified by DTE, with up to 2 resubmissions during this time period to provide a modified application. After each submission of information, DTE will notify the applicant within 10 business days that the interconnection application is either accepted or rejected due to continuing deficiencies. After accepting the modified application, DTE will have 20 business days to reapply the screens to determine if the modified application mitigates or eliminates the issues that caused the failure of the screens. If the Applicant does not meet the timelines required, the application may be withdrawn.

When an Applicant changes from a non-exporting system to an exporting system, or from an exporting to a non-exporting system, the Applicant shall submit a new interconnection application.

## **1.6 Fast Track**

The fast track is available to projects up to 5 MWac for consideration to connect to the 13.2 kV distribution system and 1 MW (Level 4) for any distribution system less than 13.2 kV, Sub transmission (24KV, 40KV and greater) projects are not eligible for fast track. Projects proposing to use limited export and using an acceptable method for limiting export as defined in Section 3.12 are eligible for fast track. If an acceptable method for limiting export is utilized, the capacity used for screening shall be the export capacity unless otherwise stated in the screen. Depending on the method utilized, the inadvertent export screens in **Appendix H**: Initial review screens may also apply. An Applicant may choose to forgo the fast track for an eligible project and proceed directly to the study track.

DTE will aggregate all proposed generation and storage on a site in determining fast track eligibility. DTE may conduct a review to determine if proposed changes to the site constitute a material modification to existing generation or storage. If so, DTE may include existing generation and storage on a site when aggregating generation to determine fast track eligibility.

Within 10 business days of providing notice of an approved application, DTE will perform a study using the initial review screens in **Appendix H** to determine the suitability of the interconnection equipment and provide the results.

If the proposed interconnection passes the initial review screens, or if the proposed interconnection fails the screens but DTE determines that the DER may be interconnected consistent with safety, reliability, and power quality standards, DTE shall notify the Applicant and inform the Applicant whether the Project will proceed to Facilities Study or directly to Interconnection and Operating Agreement.

If the proposed interconnection fails any of the initial review screens, and DTE does not or cannot determine that the DER may be interconnected consistent with safety, reliability, and power quality standards, DTE shall notify the Applicant and provide the Applicant with the results of the application of the initial review screens. DTE shall provide the Applicant with the options to attend a customer options meeting, proceed to Supplemental Review, submit a project modification, or withdraw the application.

The Applicant shall have 10 business days to decide on a course of action and notify DTE, otherwise the application shall be withdrawn. If the Applicant decides to submit a project modification, after the modified application is accepted, the initial review screen process will be repeated.

Upon the Applicant's request, DTE and the Applicant shall schedule a customer options meeting between DTE and the Applicant to review possible facility modifications, screen analysis, and related results to determine what further steps are needed to permit the DER to be connected safely and reliably to the distribution system. The customer options meeting must take place within 30 business days of the date of notification. DTE shall provide the Applicant with the options of proceeding to Supplemental Review, proceeding to the Study Track, submitting a project modification, or withdrawing the application. The Applicant shall have 20 business days to decide on a course of action and notify DTE, otherwise the application shall be withdrawn. The customer options meeting may take place in person or via telecommunications.

If a Project modification is offered by DTE, the Applicant shall either withdraw the interconnection application, or provide a modified application within 60 business days from the date the Applicant was notified by DTE, with up to 2 resubmissions being permitted during this time period for the Applicant to provide a modified application.

The application modifications must mitigate or eliminate the factors that caused the interconnection application to fail 1 or more of the initial review screens. After each submission of information, DTE will notify the applicant within 10 business days that the interconnection application is either accepted or rejected due to continuing deficiencies. After accepting the modified application, DTE will have 10 business days to reapply the screens to determine if the modified application mitigates or eliminates the issues that caused the failure of the screens. If the Applicant does not meet the timelines required, the application may be withdrawn.

## **1.7 Supplemental Review**

An applicant shall submit payment of the supplemental review fee (**Appendix B**) within 20 business days of agreeing to a supplemental review. If payment of the fee has not been received by DTE within 25 business days, the application shall be withdrawn.

Within 30 business days after the applicant pays the applicable supplemental review fee, DTE will perform a study using the supplemental review screens in **Appendix I** and notify the applicant of the results.

If the proposed interconnection passes the supplemental review screens, or if the proposed interconnection fails the screens but DTE determines that the DER may be interconnected consistent with safety, reliability, and power quality standards, DTE shall notify the Applicant and inform the Applicant whether the Project will proceed to Facilities Study or directly to Interconnection and Operating Agreement.

If the proposed interconnection fails any of the supplemental review screens, and DTE does not or cannot determine that the DER may be interconnected consistent with safety, reliability, and power quality standards, DTE shall notify the Applicant and provide the Applicant with the results of the application of the supplemental review screens.

DTE shall provide the Applicant with the options to proceed to the Study Track or withdraw the application. The Applicant shall have 10 business days to decide on a course of action and notify DTE, otherwise the application shall be withdrawn.

## 1.8 Study Track

The study track is available to all Projects that are not eligible for the non-export track, or the fast track. A Project that is eligible for the fast track may also select to skip fast track and be evaluated in the study track directly. Projects that do not pass the initial review screens or supplemental review screens or are otherwise identified to require further study while proceeding through the non-export track may also be evaluated in the study track. Projects requiring a Pre Application must complete the pre application process before proceeding to study track.

At the present time DTE only plans to conduct individual studies but reserves the right to define and implement an alternate study method.

DTE shall provide a study agreement to the Applicant within 10 business days after the interconnection application has been accepted, or within 10 business days after the applicant has notified DTE to proceed to the study track, as applicable. The study agreement will indicate the required fees as defined in **Appendix B**. In Summary, the Study Track will be used if any of the following conditions apply:

- (a) The DER is not eligible for the non-export track or fast track.
- (b) The DER did not pass the initial review screens as part of the fast track and the applicant selected the study track option in the customer options meeting.
- (c) The DER did not pass 1 or more supplemental review screens.
- (d) The DER was evaluated under the non-export track and further study is required.
- (e) The DER is eligible for the fast track, but the applicant elected the study track.

If a project begins in another track and is moved to the study track for any other reason listed above, within 10 business days after the Applicant has notified DTE to proceed to the study track, DTE shall provide a study agreement to the Applicant.

## 1.9 Study Process

Upon receipt of a signed Study agreement and required payment. DTE will proceed to study each Project in the order in which the Projects were placed into the study track, taking into account withdrawn interconnection applications and electrically remote Projects. An electrically remote Project in an individual study may be studied on an expedited schedule relative to electrically coincident DERs. Electrically remote DERs will be studied in the order the interconnection applications were deemed complete. Projects that are on hold for missing data

or other issues shall not delay the processing of any other application.

Upon request of the Applicant, a scoping meeting shall be scheduled to discuss the interconnection application and review existing fast track results, if any. The scoping meeting must take place within 20 business days after the interconnection application is considered complete by DTE or, if applicable, the fast track has been completed and the Applicant has elected to continue with the system impact study or facilities study. DTE will indicate if the project will proceed to System Impact Study, Facilities Study or will proceed directly to an Interconnection Agreement. The scoping meeting is limited to one hour and DTE may cover multiple projects with the Applicant in the same meeting.

If a Project in study is delayed due to an affected system issue, other Projects that were placed into the study track on a later date may continue to progress.

An Applicant that withdraws from the study may reapply with a new interconnection application including payment of an application fee.

A full study will begin in the System Impact Study and proceed to Facilities Study. DTE may indicate that a System Impact study is not needed, and a project can proceed directly to Facilities Study, or after reviewing the results of the System impact study determine that a Facilities Study is needed. If only a Facilities study is needed, the entry point into the process is indicated below in the Facility Study Agreement Phase.

The Study process, excluding affected system delays, holds waiting for data, company holidays and storm, is as follows:

System Impact Study Agreement (maximum 30 business days)

- DTE will provide a System Impact Study Agreement within 10 business days
- The applicant will have 20 business days to return the signed agreement with the required fee. If notice is not received by the end of this 20 business day period the application may be withdrawn by DTE.

System Impact Study Phase (maximum 60 business days)

- DTE will perform the System Impact study within 60 business days and provide written results to the Applicant at the completion of this phase and indicate if a Facilities Study is required and required study fees based on **Appendix B**.
- DTE may request additional data from the applicant within the first 20 business days of the study.

First Decision Phase (maximum 85 business day)

- Within 15 business days of receiving the System Impact study report the Applicant shall choose to proceed to a facilities study if required by the System Impact Study, request a facilities study review meeting or withdraw.
- DTE will have up to 25 business days to conduct the review meeting and will present options based on the result of the System Impact study
- After the review meeting the Applicant will have up to 45 business days to withdraw the project, proceed to facilities study, if required, or proceed with execution of interconnection agreement, if applicable. If notice is not received by the end of this 45

business day period the application may be withdrawn by DTE.

#### Facilities Study Agreement (maximum 30 business days)

- DTE will provide a Facilities Study Agreement within 10 business days.
- The applicant will have 20 business days to return the signed agreement with the required fee.

#### Facilities Study Phase (maximum 80 Business Days)

- DTE will have 80 business days to complete the facilities study and provide written results to the Applicant at the completion of this phase.
- DTE shall also offer to hold a conference call with the Applicant to discuss the written results, to occur within 30 days of the end of the study phase to the extent feasible.

#### Second Decision Phase (maximum 55 Business Days)

- Within 10 days the Applicant shall choose to proceed with execution of interconnection agreements, request a facilities study review meeting or withdraw.
- DTE will have up to 25 business days to conduct the review meeting.
- The Applicant will have up to 20 business days to proceed with execution of interconnection agreement after the review meeting. If notice is not received by the end of this 20 business day period the application may be withdrawn by DTE.

### **1.9.1 System Impact Study**

DTE will provide the Applicant with a system impact study agreement within five business days of entering the study track either directly after an application is deemed complete or after a Project moves to the study track from another track. The Applicant shall return the completed system impact study agreement, provide any additional technical data requested by DTE, and pay the required fee as indicated on the Study agreement (**Appendix E**) within 20 business days. DTE may require generator dynamic model information to comply with MISO modelling requirements.

DTE may consider the application withdrawn if the system impact study agreement, payment, and required technical data are not returned within 20 business days.

The system impact study report will identify and describe the electric system impacts that would result if the proposed Project were interconnected without electric system modifications. It will also provide a non-binding, good faith list of facilities that are required as a result of the application and non-binding estimates of costs and time to construct these facilities. The system impact study may also indicate that additional study is needed during the Facilities study phase to determine the appropriate upgrades.

DTE will complete the system impact study and provide both a system impact study and, if necessary, a facilities study agreement within 60 business days of receipt of the signed system impact study agreement, payment of all applicable fees, and any necessary technical data.

DTE may request reasonable additional data from the Applicant within 20 business days of beginning the system impact study.

DTE and the Applicant shall work together to resolve the additional data request so that DTE

will be able to complete the system impact study within the aforementioned 60 business day period.

If the Applicant does not provide the requested additional data in a timely manner, DTE will notify the Applicant that the system impact study is on hold and the date the hold started. DTE will resume work on the study when the additional data is received.

Within 15 business days of receiving the system impact study report, the Applicant shall notify DTE whether it elects to pursue a system impact study review meeting, proceed to Facilities Study, or withdraw the application. If the Applicant fails to notify DTE within 15 business days, DTE may consider the application to be withdrawn.

Upon request by Applicant, a system impact study review meeting shall be scheduled to review system impact study results and determine what further steps are needed to permit the Project to be connected safely and reliably to the distribution system. The system impact study review meeting must take place within 25 business days of DTE receiving notification that the Applicant plans to attend a system impact study review meeting. At the meeting DTE will offer the Applicant to proceed to Facilities Study, proceed directly to Interconnection & Operating Agreement if the utility determines a Facilities study is not needed, or withdraw the application. If an applicant fails to notify DTE of its selection within 45 business days of the meeting, DTE may consider the application to be withdrawn.

### **1.9.2 Facilities Study**

If a Project received a system impact study and it indicated a Facilities study was required, DTE will provide the Applicant with a facilities study agreement with the system impact study report. If no system impact study was performed, DTE will provide a facilities study agreement within 10 business days of proceeding to Facilities Study. The Applicant shall return the signed facilities study agreement and pay the required facilities study fee as indicated on the Facilities Study Agreement (**Appendix E**) within 20 business days. DTE may withdraw the application if the facilities study agreement and payment are not returned within 20 business days.

The facilities study report will specify and estimate the cost of the required equipment, engineering, procurement, and construction work, including overheads, needed to interconnect the Project, and an estimated timeline for the completion of construction.

DTE will complete the facilities study and provide a facilities study report to the Applicant within 80 business days of the receipt of the signed facilities study agreement and payment of the facilities study fee.

Within 10 business days of receiving a facilities study report from DTE, the Applicant shall notify DTE whether it elects to pursue a facilities study review meeting, proceed to an Interconnection & Operating Agreement, or withdraw the application. If the Applicant fails to notify DTE within 10 business days, DTE may consider the application to be withdrawn.

Upon request by Applicant, a facilities study review meeting shall be scheduled to review facilities study results and determine what further steps are needed to permit the Project to be connected safely and reliably to the distribution system. The facilities study review meeting must take place within 25 business days of DTE receiving notification that the Applicant plans to attend a facilities study review meeting. At the meeting DTE will offer the Applicant to proceed to Interconnection & Operating Agreement or withdraw the application. If an applicant fails to notify DTE of its selection within 20 business days of the meeting, DTE may withdraw

the application.

### 1.9.3 Cost Allocation Methodology

In the case that two or more projects agree to share the costs identified during the facilities study per the Interconnection and Distributed Generation Standards established in Case No. 21117:

*Rule 70. Costs for interconnection facilities and distribution upgrades must be classified into one of the following categories:*

*(a) Site-specific costs, which include, but are not limited to, costs of interconnection facilities and distribution upgrades that are caused by one DER, whether that DER is electrically co-incident with other DERs. These costs must be assigned to the cost-causing applicant.*

*(b) Shared interconnection facilities costs, which are costs caused by DERs which together necessitate the construction of interconnection facilities. The interconnection facilities costs that should be shared must be allocated to each applicant based on a methodology described in the electric utility's interconnection procedures.*

*(c) Shared distribution upgrade costs, which are costs caused by electrically co-incident DERs that together necessitate a distribution upgrade. The distribution upgrade costs that should be shared must be allocated to each applicant based on a methodology described in the electric utility's interconnection procedures.*

The decision to share costs must be made and mutually agreed to in writing during the overlapping study or decision period.

Shared interconnection facilities shall be split equally amongst Applicants whose Projects necessitate the shared interconnection facilities. Once an Applicant's Project interconnection facilities are in service, the upfront original cost to install those interconnection facilities can no longer be shared by future Applicants. Costs of ongoing ownership, maintenance, and future repair/replacement can still be shared by future applicants that share the interconnection facilities in accordance with interconnection agreements.

Shared distribution upgrade costs shall be allocated according to the impact of each applicant's generator on the limits exceeded for the shared distribution facilities. A simple example is shown below for a thermal constraint. The same methodology would be used for voltage, interrupting capability, or other constraints.

Limit Exceeded	Distribution Upgrade Cost	Impact of Project A	Impact of Project B
Loading on line X exceeded limit by 5 MVA	line X upgrade (\$1M)	3 MVA	2 MVA
Cost Allocation		$=(3/5*\$1M)=\$0.6M$	$=(2/5*\$1M)=\$0.4M$

Distribution upgrade costs to be paid by Applicants that have agreed to interconnection agreements will not be considered for cost allocation to subsequent applicants, unless requested and agreed to by all applicants affected.

Distribution upgrade costs and allocations of costs are subject to change due to the potential for an Applicant to withdraw up until an Applicant's Project is in service and costs are reconciled per the interconnection agreements. DTE shall endeavor to notify an Applicant as soon as possible after it becomes aware that an Applicant's cost for distribution upgrades is dependent on or changes due to any other Applicant withdrawing a Project or Projects.

#### **1.9.4 Affected System Study Process**

If during a System Impact Study or a Facilities Study DTE determines that another utility's system, or Bulk Electric System, may be affected by a proposed interconnection project, DTE shall notify the applicant and Affected System of such and place the Project in an on hold status in regards to all interconnection study timelines while an affected system study is completed. DTE shall send notification and information on the project to the affected system owner. While DTE will coordinate with the Affected System Owner, it is the applicant's responsibility to request that an affected system study be completed and respond to any associated costs or request for information from the Affected System Owner and for any scope, costs, and lead times of any upgrades required on the affected system. Once DTE receives the affected system study results from the affected system owner, the results will be incorporated into the DTE study report, the hold will be removed from the Project and the interconnection timelines will resume.

#### **1.10 Interconnection and Operating Agreement**

An interconnection agreement will be provided to the Applicant in this stage. An Applicant shall pay the actual cost of the interconnection facilities and distribution upgrades, subject to R 460.964 (8).

DTE will provide its interconnection agreement within 3 business days of reaching this stage for level 1 and 2 projects that have no construction, and within 5 business days for level 1 and 2 projects with construction. The interconnection agreement may define modifications needed to address special operating conditions. When construction of interconnection facilities or distribution upgrades is necessary, the interconnection agreement will contain a construction attachment that details the timelines for completion of activities and estimates of construction costs or a timetable when these requirements can be determined. The applicant and DTE will mutually agree on the timing of construction milestones and any operating or coordination that needs to be scheduled. The construction attachment to the interconnection agreement will include a payment schedule that corresponds to the milestones established.

The Applicant shall sign and return the interconnection agreement with payment, if applicable, within 20 business days of receiving the agreement. If this deadline is missed, the Applicant will be informed of the missed deadline and granted an extension of 15 business days. If the interconnection agreement and payment are not received during the 15-business-day extension, DTE may consider the interconnection application withdrawn.

DTE will countersign and provided a completed copy of the interconnection agreement within 10 business days of the Applicant returning a mutually agreed-upon and signed interconnection agreement.

The Interconnection agreement will also contain the terms for parallel operation authorization that the Applicant will agree to. DTE will sign the Parallel Operation Authorization after the Applicant has successfully completed commissioning and met all terms in the interconnection agreement and its attachments.

#### **1.11 Inspection, Testing, and Commissioning**

The Applicant is required to notify DTE when the installation of a Project and any required local code inspection and approval is complete. The Applicant is also required to complete any telecommunications, Cybersecurity, data exchange or remote control installation and complete any test reports, certification or configuration documents as defined in the Interconnection Agreement or Construction Agreement attachment prior to notification.

DTE will review the Applicant's inspection, test reports, or configuration documents and communicate its intent to perform a witness or commissioning test, or waive its rights to perform a witness test and commissioning test, within 10 business days.

The commissioning testing required by DTE, may include but is not limited to, confirmation of installed equipment, functional testing, and verification of protection and control system settings. DTE will provide the utility settings and commissioning test requirements prior to witness testing. The Applicant is responsible for applying DTE requirements prior to the date of witness testing and may request temporary parallel authorization if needed to apply and confirm the requirements.

If DTE finds the Applicant's inspection, test reports, or configuration documents to be incomplete, insufficient, or unsatisfactory, DTE shall provide the reasons for doing so in writing and the Applicant shall have not less than 20 business days or a mutually agreed upon timeframe with DTE to implement corrections to those documents. The Applicant, after taking corrective action, shall request DTE to reconsider the inspection, test reports, or configuration documents.

Subsequent to the successful completion of the above requirements, DTE will do the following:

- If DTE intends to witness or perform a commissioning test, the tests must be performed within 10 business days for a level 1 project and within 20 business days for a level 2 project.
- If DTE waives its right to visit the site and inspect the Project or perform the commissioning tests, it will provide a written waiver to the Applicant within 10 days of receiving notice. The Applicant shall provide DTE with the completed commissioning test report within 20 business days of receipt of this waiver.

If DTE attempts to conduct the inspection and testing at the arranged time and is unable to access the Project or complete the testing, the Project must remain disconnected until the Applicant and DTE can complete the inspection and testing.

If DTE witnessed or performed commissioning tests and inspected the Project, within 5 business days of receipt of the completed commissioning test report, DTE will notify the Applicant it has accepted or rejected the commissioning test report and if it has found the site to be satisfactory. If the commissioning test is accepted and the site is found satisfactory, DTE will notify the Applicant, and the Project will proceed to Authorization to Operate in Parallel.

If DTE waived its right to witness or perform commissioning tests and inspect the Project, within 5 business days of receipt of the completed commissioning test report, DTE will notify the Applicant it has accepted or rejected the commissioning test report. If the commissioning test is accepted, DTE will notify the Applicant, and the Project will proceed to Authorization to Operate in Parallel.

If DTE rejects a commissioning test or finds a site unsatisfactory, it will provide its reasons for doing so in writing, and the Applicant has 20 business days to implement corrections. The Applicant, after taking corrective action, shall request DTE to reconsider its findings. Do note that the Applicant may be billed the actual cost of any re-inspections.

If the Applicant does not notify DTE that the Project is installed and ready to test, DTE may, in writing, query the status of the Project. If the Applicant does not provide a written response within 10 business days or no progress is evident, DTE may consider the Project withdrawn.

## **1.12 Authorization to Operate in Parallel**

DTE will provide the Applicant with written authorization to operate in parallel with DTE within five business days of all of the following conditions being met:

- DTE notified the Applicant that the commissioning test and inspection, where applicable, are accepted.
- The Applicant complied with all applicable parallel operation requirements as set forth in these procedures and the applicable interconnection agreement.
- The Applicant complied with all applicable local, state, and federal requirements.
- DTE has received payment in full for all outstanding bills.

Upon satisfactory completion of all requirements, testing and commissioning, DTE shall issue a Parallel Operating Authorization that incorporates any ongoing requirements, terms or conditions that were defined in the interconnection agreement and construction agreement.

With this written authorization, the Project is considered approved for parallel operation, the Project may begin operating, and the Applicant is considered an interconnection customer.

The Applicant shall not operate its Project in parallel with DTE's distribution system without prior written permission to operate from DTE. Subject to reasonable timing and other conditions, including completion of conditions in the applicable interconnection agreement or these procedures, DTE will allow for reasonable, but limited, testing before written authorization has occurred.

## **1.13 Material Modification Process**

A Material Modification is a modification to the DER nameplate rating, DER Export capacity, electrical size of components, bill of materials, machine data, equipment configuration, or the interconnection site of the DER at any time after receiving notification by DTE of a complete interconnection application. Modification requests shall be submitted through PowerClerk, and as part of this process, DTE will update the project status in PowerClerk at each process step or change.

Examples of modifications that are not material would be like-for-like equipment changes including inverters or panels with the same nameplate rating and electrical characteristics that replace an existing DER component. This could occur, for example, in the case of a damage or failure where the original part is no longer available on the market, or if the specified component as originally applied for is no longer available and a new component that is the same electrically is available prior to interconnection and where settings, configuration, the nameplate DER capacity, Export Capacity and connections are unchanged. DTE is obligated to keep accurate records of DER that are interconnected with the electrical system and may request relevant data to update DER interconnection records for non-material modifications to update PowerClerk, or request verification that the appropriate control settings have been applied to systems that have non-material modifications. Regardless of the determination of material or non-material, modifications may trigger a request from DTE for updated generator modeling information or a dynamic model update from the Project to comply with MISO system and Dynamic modeling requirements.

At any point after an interconnection application is considered accepted but before the signing of an interconnection agreement, the applicant may propose modifications to the interconnection application. The applicant shall submit to DTE, through PowerClerk, all proposed modifications to any information provided in the interconnection application, and DTE shall perform an evaluation to determine whether the proposed modification is a material modification. The screening and study timelines specific to any particular interconnection application must be placed on hold while the proposed modification is being evaluated by DTE. DTE will provide the evaluation results of the material modification determination to

the applicant through PowerClerk within 10 business days of the Applicant's submission of a Material Modification request. As part of these evaluation results, and if the proposed material modifications are compatible with the DTE electrical system, DTE may provide options for performing a re-study of the material modifications. DTE shall not be required to accept or implement a modification to the DTE distribution system or generation assets that are proposed by an applicant. The Applicant may request a 1-hour consultation to discuss the results of the material modification review.

If a proposed modification is determined by DTE to be a Material Modification, it must be reviewed by DTE to determine if changes are acceptable without further or additional study. Each potential Material Modification must be reviewed by DTE on a case-by-case basis. A non-exhaustive list of example Material Modifications that may or may not require additional study are listed below.

Material Modifications that would be acceptable and typically would not require re-study:

- Small Transformer Changes (base rating remains unchanged)
  - o Minor Impedance change (evaluated on a case by case basis, dependent on connection type and/or previous study results)
  - o X/R Ratio change only
- Changes to collector system cable lengths (conductor type/size remains unchanged)
  - o Small change in lengths (evaluated on a case by case basis, dependent on connection type and/or previous study results)
- Small relocation of the point of interconnection (evaluated on a case by case basis)

Material Modifications that would typically require re-study to determine acceptability:

- Inverter Changes (other than above) that are not for the same model and configuration due to failure
- Inverter changes or upgrades to add functionality or connections.
- Addition of energy storage
- Collector System Re-Design
  - o System Voltage Change
  - o Number of Transformation Levels change
- Transformer base rating or impedance change (other than above)
- Replacement of switchgear or any wiring or switchgear replacement that changes the one line of the customer site between the generator and the PCC.
- Collector system cable changes (other than above)
- Relocation of the point of interconnection (other than above)

For a proposed modification that DTE has determined is not a material modification, or is a material modification, but does not require further study, DTE shall continue processing the interconnection application according to these procedures.

If the modification was found to be material and further study is required, the applicant shall notify DTE through PowerClerk within 10 business days of receiving the results of the material modification review with their choice of: Entering into a study agreement, withdrawing the proposed material modification; withdrawing the interconnection application; or withdrawing the proposed material modification and proposing a different material modification to start a new material modification review. If DTE does not receive a response in PowerClerk within 10 business days of the applicant receiving the notification of the results of the Material Modification review, the modification may be considered withdrawn.

If a Project must be restudied as a result of a Material Modification, the study will follow either the Supplemental Review, or Study Track process, depending on the current track of the project and the type, scale and complexity of the proposed material modifications. As part of the material modification evaluation results, timelines will be communicated to the Applicant along with any associated study fees and study agreements. Timelines and fees will be specified on a case by case basis and determined based on the scope and scale of the proposed material modifications and the extent of study required, taking into account any prior

study results or portions of study that DTE determines do not need to be re-studied.

If a DER is proposing to be modified after the execution of the interconnection agreement, and prior to DTE providing written authorization to operate in parallel, the applicant shall notify DTE through PowerClerk of any plans to modify the DER. DTE shall review the proposed modification to determine if the modification is considered a material modification. If DTE determines that the modification is a material modification, DTE shall notify the applicant in writing and through PowerClerk of its determination and the applicant shall submit a new application and application fee along with all supporting materials that are reasonably requested by DTE. The applicant may not begin any material modification to the DER until an interconnection agreement incorporating the material modification is fully executed. The new application with material modifications is subject to all applicable Interconnection Procedures and terms of a new Interconnection Agreement.

If a DER is proposing a Modification after Authorization to Operate in Parallel and the interconnection application is marked Complete in PowerClerk, and DTE determines that the proposed modification is material,, a new application must be submitted. The new application with material modification is subject to all applicable Interconnection Procedures and terms of a new Interconnection Agreement.

## 2. OPERATIONAL PROVISIONS

If a Contact List (**Appendix G**) is required, the Applicant is required to notify DTE prior to synchronizing to and prior to scheduled disconnection from the electric system.

The Project may not commence parallel operation until approval has been given by DTE. The completed installation is subject to inspection by DTE prior to approval. Preceding this inspection, all contractual agreements, payments, and obligations must be executed by the Applicant.

### 2.1 Disconnection

After interconnection, where DTE Electric finds that there are grounds to believe that a DER is operating outside the terms of the interconnection agreement, and DTE Electric determines that immediate disconnection is not warranted, DTE Electric will upon discovery of the grounds promptly inform the interconnection customer or its agent of this finding and the interconnection customer will be responsible for bringing the DER into compliance within 30 business days or a mutually agreed-upon time period, consistent with R 460.976 Rule 76.

For the avoidance of doubt, the following types of Project non-compliance shall result in prompt disconnection of a Project under R 460.978 Rule 78:

- a. Interconnecting a Project prior to approval from DTE Electric under section 1.12 of these Procedures;
- b. After interconnection and without DTE's prior written approval, changing settings on the power control system for the Project from those specified in the Interconnection Agreement; or
- c. After interconnection and without DTE's prior written approval, adding generation or storage (for example, an additional solar panel or panels) in addition to the generation or storage specified in the Interconnection Agreement.

After disconnection pursuant to (a), (b), or (c), a Project must submit a new Application, pay all accompanying costs, and restart the interconnection process prior to potential future project interconnection and authorization to operate in parallel with the DTE Electric system.

DTE may refuse to connect, or may disconnect, or revoke the Parallel Operating Authorization a project from the electric system if any of the following conditions apply:

- a. Lack of written authorization from DTE to interconnect or fully executed Generator Interconnection and Operating Agreement
- b. Termination of interconnection by mutual agreement
- c. Noncompliance with technical or contractual requirements in the Generator Interconnection and Operating Agreement, after 30 business days of notification is provided to the Applicant of the technical or contractual deficiency that does not degrade the reliability of the distribution system, electric utility equipment, and electric customers' equipment or presents a safety hazard.
- d. Electric distribution system emergency, but only for the time necessary to resolve the emergency
- e. Routine maintenance, repairs, and modifications are required and performed in a reasonable time with prior notice.

- f. Other material noncompliance with technical or contractual requirements in the Generator Interconnection and Operating Agreement.

DTE Electric may require disconnection of a Project from the distribution system for the above conditions, which may include but is not limited to the following examples:

- a. When public safety is being jeopardized.
- b. During voltage, frequency, or loading problems.
- c. When abnormal sectionalizing or circuit configuration occurs on the DTE system.
- d. During scheduled shutdown of DTE equipment that are necessary to facilitate maintenance or repairs. In the event there is demonstrated electrical interference (i.e. Voltage Flicker, Harmonic Distortion, etc.) to DTE customers, suspected to be caused by the Project, and such interference exceeds then current system standards, DTE reserves the right to install special test equipment as may be required to perform a disturbance analysis and monitor the operation and control of the Project to evaluate the quality of power produced by the Project. In the event that no standards exist, then the applicable tariffs and rules governing electric service shall apply. If the Project is the source of the interference, and that interference exceeds DTE standards or generally accepted industry standards, then it shall be the responsibility of the Applicant to eliminate the interference problem.
- e. When either the Project or its associated synchronizing and protective equipment fails or is demonstrated by DTE to be improperly maintained, so as to present a hazard to the DTE system or its customers.
- f. Whenever the Project is operating isolated (islanded) with other DTE customers, for whatever reason.
- g. Export of energy by a non-export project until non export functionality can be suitably demonstrated. DTE will not provide payment for any energy exported to the electrical system by a non-Export project.

DTE may disconnect electric service in order to disconnect a Project from the electric system, pursuant to R 460.136.

## **2.2 Maintenance and Testing**

DTE reserves the right to test the relaying and control equipment that involves protection of the DTE electric system whenever DTE determines a reasonable need for such testing exists.

The Applicant is solely responsible for conducting and documenting periodic maintenance and testing on the generating equipment and its associated control, protective equipment, interrupting devices, and main isolation device, per manufacturer recommendations. DTE reserves the right to review the documentation of periodic maintenance and/or power quality information that the applicant has collected.

If protective relaying is required per the technical requirements, the Applicant is responsible for conducting and documenting periodic maintenance and testing every 4 years on relays and the associated interrupting devices, control schemes, and batteries, unless a written extension is provided by DTE. If testing is required, it shall be conducted in accordance with the test procedures provided by DTE as part of inspection testing. DTE reserves the right to review the

protection settings at any time and provide changes to those settings as needed.

DTE reserves the right to witness the testing. The Applicant is responsible for maintaining written reports for the above tests for a period of four years. These written reports shall be made available to DTE upon request.

### 3. INTERCONNECTION PROCEDURES TECHNICAL REQUIREMENTS

The following discussion details the technical requirements for interconnection of Level 1 and 2 Projects. Many of these requirements may not be applicable to the majority of level 1 or 2 projects but are included herein for the small number of cases when they may be needed. Many of these requirements will vary based on the AC nameplate DER capacity and Export Capacity of the Project, generation type, voltage level, and mode of operation (Export or Non-Export). A few of the requirements will vary based on location of the interconnection (isolated load and available fault current).

Certain major components, as specified in this document, must be met to provide compatibility between the Project equipment and the DTE electric system, and to ensure that the safety and reliability of the electric system is not degraded by the interconnection.

DTE reserves the right to evaluate and apply newly developed protection and/or operation schemes at its discretion. All protective schemes and functions are evaluated for compliance to IEEE 1547-2018. In addition, DTE reserves the right to evaluate Projects on an ongoing basis as system conditions change, such as circuit loading, additional generation placed online, or if required to do so by the regional Transmission operator, reliability coordinator or Independent System Operator etc.

#### 3.1 Applicability of IEEE 2800:

The Company currently owns equipment at the following voltages that may require the application of certain IEEE 2800 clauses for inverter-based resources (IBRs):

- Distribution (4.8 kV, 8.3kV and 13.2kV)
- Subtransmission (24 kV, 34.5kV and 40kV)
- High voltage radial lines (typically 120kV, but includes 100 kV or above)

IEEE 2800 shall be applied to projects connected at the transmission level. For Sub-transmission connected projects, IEEE 2800 shall apply with the exception of 4.1 and 4.2 with references to Transmission System Operator (TSO) being replaced with Electric Distribution Company (EDC).

Following the System Impact Study, for projects connected to the distribution system that are determined to have an impact on the transmission system, subtransmission system, or high voltage radial lines, the following subset of the IEEE 2800 clauses shall be applied: 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 4.9, 4.10, 4.12, 10, with references to Transmission System Operator (TSO) being replaced with Electric Distribution Company (EDC).

IEEE 2800 Clause 10 includes requirements for verified IBR plant-level models, documentation detailing development process and verification of these models, and documentation with brief explanation of control strategy. This information shall be provided as part of the Interconnection Application prior to study, or when DTE has determined that a proposed modification is a material modification. After interconnection and/or upon request from the utility, the applicant shall provide within 90 days either updated models or verification that there has been no change to previously submitted models.

For distribution-connected projects applicable IEEE 2800 requirements may be satisfied as follows: For projects utilizing a single inverter, the inverter shall be certified as defined in the procedures and implement settings as provided by DTE, and such certification shall be considered sufficient for meeting the applicable IEEE 2800 clauses. If multiple inverters are configured as a plant, the individual inverters shall be certified as defined in the procedures and implement settings as provided by DTE, and the overall plant shall meet the applicable IEEE 2800 clauses.

### 3.2 Major Component Design Requirements

The data requested for all major equipment and relaying proposed by the Applicant, must be submitted as part of the initial interconnection application for review and approval by DTE. DTE may request additional data be submitted during the interconnection process to clarify the operation of the Project facilities.

Once installed, the interconnection equipment must be reviewed and approved by DTE prior to being connected to the DTE electric system, and before parallel operation is allowed.

### 3.3 Data

The data that DTE requires to evaluate the proposed interconnection is documented on the generator interconnection application (**Appendix D**). A site plan and one- line diagram with details of the interconnection protection system, are required as part of the application data. For level 2 projects, the one-line diagram must be sealed by a professional engineer licensed in the state of Michigan or signed by an electrical contractor licensed in Michigan with the electrical contractor’s license number noted on the diagram. Three line diagrams and protection configurations may be required depending on the DER connection type and location of the Applicant facility. The generator manufacturer data package should also be supplied including any supplemental equipment datasheets necessary to characterize the DER.

DTE may require the applicant to provide modelling information of the DER to comply with MISO reliability and system modeling requirements.

The Applicant may request DTE study the Project at a reduced power output (Export Capacity) below the AC nameplate DER Capacity. The Applicant must provide the export capacity and method used to reduce the power output as part of the application data for review and approval by DTE.

### 3.4 Isolating Transformers

If a transformer is utilized, the transformer shall meet the following requirements.

- The transformer shall comply with the current ANSI Standard C57.12.
- The transformer shall have voltage taps on the high and/or low voltage windings sufficient to assure satisfactory generator operation over the range of voltage variation expected on the DTE electric system.
- The proper selection and specification of transformer impedance is important relative to enabling the proposed Project to meet DTE’s reactive power requirements (see “Reactive Power Capability and Voltage Control”).
- The transformer utility and Project side winding connections shall be selected using the following table. The transformer may have multiple project side windings.

PCC Voltage	System Configuration	Transformer Winding Connection		Special Requirements
		Utility Side	Project Side	
40 kV	Grounded Wye	Delta	No Preference	

		Grounded Wye	Delta	See Note 1
Below 40 kV	Grounded Wye	Grounded Wye	Ungrounded Wye	See Note 2
			Grounded Wye	See Note 3
	Delta	Delta	No Preference	

Table – Three Phase Transformer Winding Connections

Note 1: Requires the Project to be connected to its own line exit.

Note 2: Additional transformers connected to the Project side transformer winding cannot in combination with each other be a source of zero sequence current. For example, an ungrounded wye to delta transformer with the neutrals of both ungrounded wye transformer windings connected. The connection of the neutrals would cause the series combination of the grounded wye to ungrounded wye transformer and the ungrounded wye to delta transformer to mimic a grounded wye to delta transformer which is a source of zero sequence current.

Note 3: Additional transformers connected to the Project side transformer winding cannot be a source of zero sequence current. For example, the transformer may not be connected Grounded Wye (utility side) – Delta (Project side).

### 3.5 Interrupting Device

A three-phase interrupting device is required between the Project and DTE, where applicable as determined by DTE. The interrupting device may be required to be located at the PCC depending on protective and operational requirements of the area. If required, the interrupting device shall meet the following requirements.

- Must be a recloser, circuit switcher, or breaker.
- Must be approved for use on the DTE electric system.
- Must comply with current relevant ANSI and/or IEEE Standards.
- Must be rated for the application.
- Must have adequate interrupting capability. DTE will provide maximum short circuit currents and X/R ratios for faults at the PCC upon request.

### 3.6 Isolation Device

A main isolation device, that is readily accessible, lockable and provides a visible break shall be located between DTE and the project DER when required by DTE operating procedures as determined by the operating voltage of the site.

An isolation device is required and should be placed at the PCC. It can be a pole top switch, load-break disconnect, etc., depending on the electrical system configuration. The isolation device shall meet the following requirements.

- Must be approved for use on the DTE electric system.
- Must comply with current relevant ANSI and/or IEEE Standards.
- Must have load break capability, unless used in series with a three-phase interrupting device.

Must be rated for the application.

- Must be operable and accessible by DTE at all times (24 hours a day, 7 days a week). If the device is remotely operable, DTE shall have remote access to the device at all times.
- The isolation device will be used as a protective tagging point. The device must have visible open break provisions for padlocking in the open position, and it must be gang operated. If the device has automatic operation, the controls must be located remote from the device.
- The installation of the device shall meet OSHA, NEC, and NESC requirements for access and arc flash.
- Must be clearly marked to include signage per the National Electrical Code (NEC), as applicable.

### **3.7 Interconnection Facilities**

The available system voltage, as well as equipment and operational constraints influence the chosen point of interconnection. DTE has the ultimate authority to determine the acceptability of a particular PCC.

Any new line or interconnection facilities required to connect the Project to DTE's electric system will be constructed by DTE at the Applicant's expense. DTE may require one or more utility owned and controlled devices and supporting structures to allow for communication and control and proper operation of the electrical system. These will be included in the interconnection facilities.

DTE may require the new line construction to be terminated on a structure provided by the Applicant. Interconnection lines and facilities must be coordinated with DTE.

The applicant is responsible for securing any new Rights of Way for the project interconnection facilities or line extensions.

### **3.8 Termination Structure**

The Applicant is responsible for ensuring that structural material strengths are adequate for all requirements. Upon written request, DTE will provide maximum dead-end line tension information. The structure shall adhere to the latest edition of the National Electrical Safety Code (NESC) as adopted by the commission and in accordance with DTE design standards.

Electrical clearances shall adhere to the latest edition of the NESC as adopted by the commission and according to DTE design standards and shall be coordinated with DTE.

The installation of disconnect switches, bus support insulators, and other equipment shall comply with accepted industry practices.

Surge arresters shall be selected to coordinate with the BIL rating of major equipment and rated for the application.

### **3.9 Inverters**

Certified inverter Projects must use inverter(s) that conform to the IEEE 1547.1-2020 standard. In order to show compliance, a certificate of compliance from an OSHA approved national recognized testing laboratory must be submitted as part of the application and the manufacturer must mark the equipment such that a field inspection can verify the certification. The

certification of compliance must clearly state the inverter has been tested to the latest UL 1741 using IEEE 1547.1-2020 as the functional Source Requirement Document.

The inverters shall be certified to meet the following performance Categories.

1. Normal Operating Performance – Category B

Abnormal Operating Performance – Category III \*\* The manufacturer is required to mark the abnormal operating category on the equipment.

If the requirements of this section are met, the inverter is deemed “certified” as defined within **Appendix C**.

Documentation of harmonics testing of the inverter to IEEE-519 standards and supporting harmonics tables shall be submitted to DTE, where applicable as determined by DTE.

### **3.10 Interconnection Protection**

The interconnection relaying design requirements are intended to assure adequate protection of the DTE electric system. Any additional relaying which may be necessary to protect equipment at the Project is solely the responsibility of the Applicant to determine, design, and apply.

The relaying requirements will vary with the DER capacity rating of the Project, the type of generation being used, configuration of the Project, and the mode of operation (Export or Non-Export).

All relaying proposed by the Applicant to satisfy these requirements must be submitted for review and approved by DTE. DTE may request test records and verification of settings operation at any time.

### **3.11 Protective Relaying General Considerations**

The installation of utility grade relays are required for all Project types, where applicable as determined by DTE. All relays must be equipped with targets or other visible indicators to indicate that the relay has operated.

If the protective system uses AC power as the control voltage, it must be designed to disconnect the generation from the DTE electric system if the AC control power is lost. DTE will work with the Applicant regarding the system design for this requirement.

The protective system must be designed such that the Applicant is prevented from energizing the DTE electric system if that system is de-energized.

DTE may require a breaker failure detection scheme and alarming or other failsafe systems to identify and mitigate mis-operation of the protection system.

### **3.12 Capacity of the DER and Acceptable methods for power limiting or export control**

DTE shall study interconnection of limited-export or non-exporting generating facilities and energy storage and allow those that meet the requirements in this section and R 460.980(4). The applicant must submit an interconnection application based on the total aggregate AC nameplate capacity (DER Capacity) of the site that will be defined as the maximum capacity and supply the maximum deliverable fault current of the DER(s). An export capacity may be supplied

in the application for consideration by DTE; however, all determinations of project level and application of interconnection process will be made with reference to the DER Capacity unless otherwise specified. The DER Capacity used to review an interconnection application for an inverter-based resource will be the lesser of the nameplate capacity of generation and storage equipment or the nameplate capacity of the inverter(s). DTE will perform studies and screens based on the relaying or power control method being utilized and assess the risk of the export capacity method vs the DER Capacity. Additionally, some screens and studies will apply other electrical and operating parameters of the DER. For example, screens and studies that evaluate protection fault current shall use full instantaneous fault rating of the device as fault current is not controlled through power limiting functions, only steady state power output. Similarly screens and studies may use the total power output in Apparent power (MVA) when considering the impacts of voltage control modes that may reduce the real power output.

If a DER uses any configuration or operating mode to limit the export of electrical power across the Point of Common Coupling, then the export limited capacity shall be only the amount capable of being exported. To prevent impacts on system safety and reliability, DTE will assess the risk of the proposed method based on the DER Capacity against the proposed export capacity and the method proposed by the applicant as described in the screening process in **Appendix H**. The export capacity, if accepted, will be documented independently from the DER AC nameplate rating in the Interconnection as a condition of the Interconnection Agreement and Parallel Operation Authorization.

An Applicant is required to provide the export capacity in the application, which is either the DER Capacity or a lower amount defined below when using one of the following methods.

See **Appendix H** for additional initial fast track and study screening criteria and requirements for export-limited systems.

If the period of continuous inadvertent export from a certified PCS or inverter exceeds 30 seconds, the DER shall disconnect from the distribution system, cease to energize the distribution system, or halt energy production within 2 seconds, and then follow return to service criteria. Inadvertent export outside of these ranges including repetitive or frequent inadvertent export shall be subject to disconnection until the equipment can be repaired and brought back into compliance through verifiable testing.

The following methods may be accepted:

1. 32R Relay Reverse power

This relay will be applied to non-export projects. The reverse power relay must be selected such that it can detect a power flow in the DTE system of a small fraction of the overall Project DER capacity. The relay will trip a dedicated generation breaker, the generation prime mover, or a breaker identified by the applicant that can verifiably isolate the generation within the required timing. The relay will normally be set near its minimum (most sensitive) setting and will take into account the total metering accuracy of the protection system. By default, it will trip after a 1 second time delay. The delay will avoid unnecessary tripping for momentary conditions. More specific settings will be issued on a case-by-case basis and be documented in the Interconnection Agreement.

2. 32R Relay Reverse power - Power limiting

This relay will be applied to limited export projects. The reverse power relay must be selected such that it can detect a power flow into the DTE system above the Project export capacity. The relay will trip a dedicated generation breaker, the generation prime mover, or a breaker identified by the applicant that can verifiably isolate the generation within the required timing. The relay will normally be set to

have 102% of the export capacity and will take into account the total metering accuracy of the protection system. By default, it will trip after a 2 second time delay. The delay will avoid unnecessary tripping for momentary conditions. More specific settings will be issued on a case-by-case basis and be documented in the Interconnection Agreement.

3. 32U Relay – Under Power (Minimum Import)

This relay will be applied to limited export projects. The Under-power relay must be selected such that it can detect a minimum amount of power flow from the DTE system. The relay will trip a dedicated generation breaker, the generation prime mover, or a breaker identified by the applicant that can verifiably isolate the generation within the required timing. The relay will normally be set near its minimum (most sensitive) setting and will take into account the total metering accuracy of the protection system. By default it will trip after a 2 second time delay. The delay will avoid unnecessary tripping for momentary conditions. More specific settings will be issued on a case by case basis and be documented in the Interconnection Agreement. Special consideration should be taken when selecting and setting and under-power function due to minimum operating quantities required for the function to operate correctly.

4. The nameplate rating of the DER, minus any auxiliary load, must be so small in comparison to its host facility's minimum load that the use of additional protective functions are not required to ensure that power is not exported to the distribution system. This option requires the DER capacity must be no greater than 10% of the applicant's verifiable minimum gross load over the past 12 months. The customer is responsible for disabling the DER for any times where load will fall below the value specified in the interconnection agreement, such as during a plant shutdown or maintenance activities.
5. A reduced output rating utilizing the power rating configuration setting may be used to ensure the DER does not generate power beyond a certain value lower than the nameplate rating. This adjustment to nameplate rating must show permanent modification of the DER output capability with vendor documentation and equipment labelling indicating the nameplate value has been changed. This nameplate change must be stable through firmware updates and not be user modifiable. An inverter settings compliance report is required upon commissioning and at any time upon request from the utility.
6. DERs may utilize a Nationally Recognized Testing Laboratory Certified Power Control System and inverter system that limits the ability of end users to modify PCS limits, as required by NEC 750.30(C), UL 3141 6.17, or other applicable standard. The Customer is responsible for maintaining the settings provided and verified in the commissioning tests. . An inverter settings compliance report is required upon commissioning and at any time upon request from DTE.

The applicant may propose alternative methods to ensure power is not continuously exported above a mutually agreed upon limit across the point of common coupling. The applicant must provide detailed documentation stating how the alternate method limits export and inadvertent export levels to levels approved by DTE. The applicant must list the export capacity as the mutually agreed upon limit in the application when using an alternative method. Review of the alternative method may result in the application being placed on hold to provide sufficient time to review the proposed method. DTE will evaluate the method to determine if it will meet criteria for safe and reliable operation that are compatible with the electrical system and operating practices.

The following process will be used to evaluate inverter based power control systems.

#### Power limiting process

1. Applicant applies for a system with an inverter(s) and lists a desired export limited capacity in addition to the DER nameplate and DER capacity. Power limiting is not applicable to discrete microinverters unless they centralize to a concentrator that meets PCS standards and has been certified to operate with the microinverters as a system.
2. Applicant also selects an applicable inverter that implements either a reduced output rating or power limiting function.
3. DTE identifies that the project requires power limited export due to site restrictions, safety concerns, tariff requirements or regulatory compliance. Alternatively, power limited export is chosen as an option by the applicant.
4. Applicant provides one-line or three line diagram indicating equipment with power-limited export and associated measuring, metering and sensing devices.
5. DTE ensures that the selected inverter has power-limited export capability meeting the criteria in the acceptable methods for power limiting and export control.
6. DTE provides applicant the required power-limited export value in kW for each specified inverter.
7. DTE approves the application package and allows the applicant to construct the project and instructs applicant to provide necessary power-limited export documentation. The required documentation is as follows:
  - a. Manufacturer supplied inverter settings compliance report. This report should include the inverter manufacture, inverter model, inverter unique identification number, a power-limited export value in kW, manufacturer contact information and the address that the inverter will be installed at.
  - b. Photograph of the nameplate or LCD display on each specified inverter showing a unique identification number (such as serial number) that matches the compliance report.
  - c. Photograph of Inverter power-limited export value setting in kW as applicable to that inverter model.
8. Applicant obtains required documentation to prove that specific inverters at a given premise are limited to the DTE required limit and provides that documentation to DTE.
9. DTE verifies that all the provided documentation meets all the necessary requirements to implement the power-limited export and keeps a record of the inverter settings and compliance report.
10. DTE may ask for validation of the settings at any time, and if settings have changed, the DER is subject to disconnection as a violation of the Interconnection Agreement and Parallel Operating Authorization.

### **3.13 Testing and certification requirements of DER telecommunications, cybersecurity, data exchange, and remote control operation**

Based on the Project system impact, Size, Project design, existing and proposed grid equipment, operational constraints, design standards, Project operational requirements, risk to critical infrastructure or other customers, compliance to program or tariff or other factors DTE shall undertake a review of necessary telecommunications, settings, configuration, cybersecurity, data exchange and remote control requirements and determine what if any requirements are appropriate for the project to safely and reliably connect to the electrical system These requirements will be detailed in the Construction Agreement attachment to the Interconnection Agreement and are a requirement for interconnection.

DTE may determine in an effort to expedite Project progress, and at its sole discretion, that no additional study or review is needed and provide a set scope of telecommunications, settings, configuration, cybersecurity, data exchange and remote control that is acceptable to the Utility. This may be provided as a standard package prior to any study to allow the Project to understand its responsibilities.

Notwithstanding Project and site specific requirements determined during study or review, the following will be true for all projects and requirements will be detailed in the Construction Agreement attachment to the Interconnection Agreement:

Projects exceeding 1MW and those required by study to SCADA must have utility SCADA monitoring utilizing a DTE specified point list, method of transport and protocols either through a DTE provided device or utilization of customer switchgear or breaker and relaying equipment as agreed to by DTE.

Metering equipment, CTs, PTs and associated telecommunications will be provided and maintained by DTE. It is the customer's responsibility to provide meter sockets, CT cabinets, support structures, conduit and wiring in compliance with DTE Service Installation Manual, Primary Services Design and all relevant and effective codes and procedures.

Study may indicate that projects of any size may require additional telecommunications, cybersecurity, data exchange, and remote control.

Projects desiring market access will be subject to designs that are compliant with MISO or other market requirements.

Projects participating in Utility programs or Tariffs may be subject to additional requirements for testing, certification, telecommunications, cybersecurity, data exchange, and remote control as dictated by and in compliance with those programs or Tariffs.

Projects that have BES, NERC or FERC compliance requirements shall be notified of their responsibility and be subject to the current and on-going responsibilities entailed in those requirements as part of the interconnection agreement and the Authorization for Parallel Operation.

Interface between DTE and the project shall conform with DTE design and cybersecurity standards and be in compliance with the current IEEE1547 including the current version of IEEE 1547.3.

DTE is not responsible for the Projects telecommunications to the project owner, operator or other third parties that the Project may be associated with. This would also include communications to and from market entities by the Project.

DTE will specify site specific design requirements, configurations, hardware and network architecture to ensure necessary isolation of metering and grid control networks from the public internet, customer networks and any other networks present at the Project site(s).

### **3.14 Momentary Paralleling**

For situations where the Project will only be operated in parallel with DTE electric system for 100 milliseconds or less, as in a make-before-break automatic transfer scheme, no additional relaying is required. Such momentary paralleling requires a modern integrated Automatic Transfer Switch (ATS) system, which is incapable of paralleling the Project with the DTE electric system. The ATS must be tested and verified for proper operation at least every 4 years unless a written extension is provided by DTE. DTE may be present during this testing. DTE may request test records and verification of operation at any time.

### **3.15 Instrument Transformer Requirements**

All relaying, if utilized, must be connected into instrument transformers. DTE may allow the use of Capacitive Voltage Sensors for select protective functions.

All current connections shall be connected into current transformers (CTs). All CTs shall be rated to provide no more than 5 amperes secondary current for all normal load conditions, and must be designed for relaying use, with an “accuracy class” of at least C50. Current transformers with an accuracy class designation such as T50 are NOT acceptable. For three-phase systems, all three phases must be equipped with CTs.

All potential connections must be connected into voltage transformers (VTs). For single-phase connections, the VTs shall be provided such that the secondary voltage does not exceed 120 volts for normal operations. For three-phase connections, the VTs shall be provided such that the line-to-line voltage does not exceed 208 volts for normal operation, and both the primary and secondary of the VTs shall be connected for grounded-wye connections

### **3.16 Direct Transfer Trip (DTT) and Supplemental Anti-Islanding**

Direct Transfer Trip may be required as indicated by supplemental anti-islanding screening or during study, to prevent sustained isolated operation of the generation, or for conditions where voltage and frequency protective relaying at the Project may not otherwise operate. Direct Transfer Trip or supplemental anti-islanding is generally not required for Projects that will operate in the Non- Export Mode since a more economic reverse power relay scheme can usually meet the requirements. For Export Projects, the need for DTT or supplemental anti-islanding is determined based on the location of the PCC and generation type during fast track screening or the System Impact Study protection review.

For Fast Track projects screening for anti-islanding uses of DTT and supplemental anti-islanding will be applied as contained within the initial review screens, which may lead to a supplemental review for risk of islanding. For study track projects and projects on networked systems the requirements for DTT or supplemental anti islanding functions and associated equipment will be determined during the relay protection review in the system impact study.

For projects that fail unintentional island screening, an approved supplemental anti-islanding method shall be used. This prevents sustained isolated operation of the generation for conditions where the inverter anti-islanding may not otherwise trip the Project. Inverter based Projects shall be certified to comply with anti-islanding safety standards in addition to any DTT requirements.

Approved methods of supplemental anti islanding include protective relays for the detection of over-/underfrequency or over/undervoltage, reverse power detection, or minimum import/export relays, and direct transfer trip (DTT).

Direct Transfer Trip and supplemental anti-islanding may add to the cost and complexity of an interconnection. The Applicant will be responsible for all expenses associated with the installation, operation, and maintenance of the DTT or supplemental anti-islanding system.

When DTE determines that DTT is required, a DTT transmitter, installed by DTE, is generally required for each Utility protective device whose operation could result in sustained isolated operation of the Project. At least one associated DTT receiver, that is supplied, owned, operated and maintained by DTE, is required at the Project. A data Communication Circuit is generally required at each transmitter and receiver location dependent on the DTT technology. Telemetry is required to monitor status of the DTT communication, even if telemetry would not otherwise have been required.

The Applicant shall provide a suitable location, approved by DTE, for the Applicant to install the DTT receiver and associated equipment. The Applicant shall provide the following connections and associated equipment to the location, which may include but is not limited to:

1. A 24, 48 V or 125 V DC power supply capable of providing an 8-hour backup. The Applicant shall coordinate with DTE to properly size the DC power supply.
2. A 120 V AC power supply for heating unconditioned (e.g. outdoor) locations and for use with AC/DC converters. The Applicant shall coordinate with DTE to properly size the AC power supply.
3. A control circuit or communication cable to allow the DTT receiver to trip and lockout the Project.
4. A control circuit for transferring telemetry and disturbance monitoring statuses (e.g. LOG, RTX) to the Project prior to being passed to the RTU using the Communication Interface.
5. An antenna cable for connection to an external antenna. DTE will supply the antenna cable.
6. A communication cable for connection to Communication Circuit equipment (e.g. Router/Switch).
7. A voice Communication Circuit, when cellular phone service is not available, for the commissioning and checkout of the metering, DTT, and RTU.

The above connections shall be connected to the DTT receiver by the Applicant where indicated by DTE.

### **3.17 Reverse Power Relaying for Non-Export**

If Export Mode is not utilized, reverse power protection must be provided. The reverse power relaying will detect power flow from the Project into the DTE system, and operation of the reverse power relaying will separate the Project from the DTE system.

### **3.18 Automatic Reclosing**

DTE employs automatic multiple-shot reclosing on most of the circuit breakers and circuit reclosers to increase the reliability of service to its customers. Automatic single- phase

overhead reclosers are regularly installed on distribution circuits to isolate faulted segments of these circuits.

The Applicant is advised to consider the effects of Automatic Reclosing (both single-phase and three-phase) to assure that the Project's internal equipment will not be damaged. In addition to the risk of damage to the Project, an out-of-phase reclosing operation may also present a hazard to DTE equipment that may not be rated or built to withstand this type of reclosing.

DTE will determine relaying and control equipment (e.g. volt check relays) that needs to be installed to protect its own equipment from out-of-phase reclosing. Installation of this protection will be undertaken by DTE at the expense of the Applicant. DTE shall not be liable to the customer with respect to damage(s) to the Project arising as a result of Automatic Reclosing.

### **3.19 Single-Phase Sectionalizing**

DTE also installs single-phase fuses and/or reclosers on its distribution circuits to increase the reliability of service to its customers. Three-phase generator installations may require replacement of fuses and/or single-phase reclosers with three-phase circuit breakers or circuit reclosers at the Applicant's expense.

### **3.20 Synchronous Projects**

Level 1 and 2 projects must be inverter based

### 3.21 Induction Projects

Level 1 and 2 projects must be inverter based

### 3.22 Inverter Projects

To expedite processing, Inverters used in projects should appear on the California Energy Commission's list for certified equipment (<https://www.energy.ca.gov/programs-and-topics/programs/solar-equipment-lists>). Use of an inverter that is not on the CEC list requires the submission in the application of the appropriate UL1741 certification document for the current active supplement version that matches the exact model being utilized and additional supporting information to accurately represent the inverter in the application. Failure to produce the UL certification or discrepancies in the documentation may result in the application being placed on hold while DTE reviews the provided documentation.

Three-phase or three single-phase over/under frequency (81O/U) relaying and under/overvoltage (27/59) relaying are required. The 27, 59 and 81O/U relays shall be connected to VTs located at the PCC, unless otherwise approved by DTE. VTs connected to the Project side of transformers without zero sequence continuity (e.g., ungrounded wye or delta winding connections) on a grounded distribution system is not allowed.

Transformers 15 MVA (self-cooled rating) or larger shall be equipped with differential (87) relaying thus requiring a three-phase interrupting device on the utility side of the isolation transformer.

If the Project is connected to a grounded distribution system, ground fault detection for utility faults is required and will consist of a (59N) ground overvoltage relay. The (59N) relay will be connected into the secondary of a set of three-phase VTs, which will be connected grounded-wye primary, with the secondary connected delta with one corner of the delta left open or grounded-wye depending on the relay input requirements. The 59N relay shall be connected to VTs located at the PCC, unless otherwise approved by DTE. VTs connected to the Project side of transformers without zero sequence continuity (e.g. ungrounded wye or delta winding connections) is not allowed.

In some instances, additional (59N) relaying may be required for situations where DTE owns an isolation transformer.

## 3.23 Interconnection Protection Settings

### 3.23.1 Relay Setting Criteria

The relay settings as detailed in this section may apply in a very limited set of circumstances where a relay is utilized in the application. Compatible settings may be issued to an inverter-based project if multiple devices are used. DTE will issue relay settings for each individual Project that will address the settings for these protective functions. All voltages will be adjusted for the specific VT ratio, and all currents will be adjusted for the specific CT ratio. The trip times and thresholds of the over/under voltage and frequency relays may vary depending on Ride Through requirements.

#### *Undervoltage Relays*

Two steps of undervoltage relaying are required when Ride Through is enabled. For the first overvoltage set point, the undervoltage relays will normally be set to trip at 88% of the nominal primary voltage at the relay location, and must reset from a trip condition if the voltage increases to 90% of the nominal primary voltage at the relay location. In order to accommodate variations in this criterion, the trip point of the relays shall be adjustable over a range of 70% of the nominal voltage to 90% of the nominal voltage. The trip time shall not exceed 1.0 seconds at 90% of the relay setting. When Ride Through is enabled, the trip time shall be 5.0 seconds at 90% of the relay setting.

For the second undervoltage set point, the undervoltage relays will normally be set to trip at 70% of the nominal primary voltage at the relay location and must reset from a trip condition if the voltage increases to 72% of the nominal primary voltage at the relay location. In order to accommodate variations in this criterion, the trip point of the relays shall be adjustable over a range of 50% of the nominal voltage to 90% of the nominal voltage. The trip time shall be 1.0 second at 90% of the relay setting.

#### *Overvoltage Relays*

Two steps of overvoltage relaying are required. For the first overvoltage set point, the overvoltage relays will normally be set to trip at 110% of the nominal primary voltage at the relay location, and must reset from a trip condition if the voltage decreases to 108% of the nominal primary voltage at the relay location. In order to accommodate variations in this criterion, the trip point of the relays shall be adjustable over a range of 105% of the nominal voltage to 120% of the nominal voltage. The trip time shall not exceed 1.0 seconds at 110% of the relay setting.

For the second overvoltage set point, the overvoltage relays will normally be set to trip at 120% of the nominal primary voltage at the relay location, and must reset from a trip condition if the voltage decreases to 118% of the nominal primary voltage at the relay location. In order to accommodate variations in this criterion, the trip point of the relays shall be adjustable over a range of 115% of the nominal voltage to 140% of the nominal voltage. The trip time shall be instantaneous (relay operating time not to exceed 0.02 seconds at 110% of the trip setting).

#### *Underfrequency Relays*

Two steps of underfrequency relaying are required when Ride Through is enabled. For the first underfrequency setpoint, the underfrequency relay will normally be set for a trip point of 58.5 Hz and must trip instantaneously within 0.2 seconds. When Ride Through is enabled, the trip time shall be 300 seconds unless otherwise specified. Relays with an inverse time

characteristic (where the trip time changes with respect to the applied frequency) are not acceptable. These relays must respond reliably for applied source voltages as low as 70% of the nominal voltage.

For the second underfrequency set point, the underfrequency relays will normally be set for a trip point of 57.0 Hz and must trip instantaneously within 0.2 seconds. Relays with an inverse time characteristic (where the trip time changes with respect to the applied frequency) are not acceptable. These relays must respond reliably for applied source voltages as low as 70% of the nominal voltage.

#### *Overfrequency Relays*

Two steps of overfrequency relaying are required when Ride Through is enabled. For the first overfrequency set point, the overfrequency relay will normally be set for a trip point of 60.5 Hz, and must trip instantaneously within 0.2 seconds. When Ride Through is enabled, the trip time shall be 300 seconds unless otherwise specified. Relays with an inverse time characteristic are not acceptable. These relays must respond reliably for applied source voltages as low as 70% of the nominal voltage.

For the second overfrequency set point, the overfrequency relay will normally be set for a trip point of 62.0 Hz and must trip instantaneously within 0.2 seconds. Relays with an inverse time characteristic are not acceptable. These relays must respond reliably for applied source voltages as low as 70% of the nominal voltage.

#### *51V Relays – Voltage Restrained Overcurrent Relays*

For synchronous Project applications, the (51V) relays must be set to detect any phase faults that may occur between the Project and the nearest three-phase fault clearing device on the DTE system. Since these faults may take up to 1-second to detect and isolate, the appropriate saturated direct-axis reactance of the Project will be used depending on its time constants. The CT ratios and specific relay settings will be determined via a fault study performed by DTE. The settings of this device will consider the relay manufacturer's recommended practice for the type of Project and prime mover (mechanical energy source) and will be determined by DTE for the specific system application.

#### *59N Relay – Ground Fault Detection*

This relay will be applied to detect ground faults on the DTE system when the Project is connected to a grounded Utility system and not capable of providing an adequate quantity of ground fault current for a 51N relay. This relay will be set for a 10% shift (10 multiples of pickup) in the apparent power system neutral. For an ungrounded-wye transformer winding with a single 120 V secondary VT, the setting will usually be 12 Volts. For a delta transformer winding with broken delta 120 V secondary VTs, the setting will usually be 20 Volts. The time delay will normally be 1 second.

#### *51N Relay – Ground Fault Detection*

This relay will be applied to detect ground faults on the DTE system when the Project is connected to a grounded Utility system and capable of providing an adequate quantity of ground fault current. This relay will be set to detect faults on the directly connected Utility system, and the timing will be set to comply with Utility practice for overcurrent relay

coordination. The CT ratio and specific relay setting will be determined via a fault study performed by DTE.

### *32 Relay – Reverse Power*

This relay will be applied to Non-Export projects. The reverse power relay must be selected such that it can detect a power flow into the DTE system. The relay will normally be set near its minimum (most sensitive) setting and will trip after a 1 second time delay. The delay will avoid unnecessary tripping for momentary conditions.

This relay will be applied to limited export projects. The reverse power relay must be selected such that it can detect a power flow into the DTE system above the maximum Project export capacity. The relay will normally be set to have 102% of the maximum export Project capacity and will trip after a 5 second time delay. The delay will avoid unnecessary tripping for momentary conditions.

### *32U Relay – Under Power (Min Import)*

This relay will be applied to limited export projects. The under-power relay must be selected such that it can detect a minimum amount of power flow from the DTE system. The relay will normally be set near its minimum (most sensitive) setting and will trip after a 5 second time delay. The delay will avoid unnecessary tripping for momentary conditions. Special consideration should be taken when selecting and setting an under-power function due to minimum operating quantities required for the function to operate correctly.

## **3.23.2 Inverter Setting Criteria**

DTE will provide inverter settings to the Project Developer. The Project Developer will be responsible for setting the inverters. The settings may include but are not limited to the following:

- Protective Functions – Under/Over Frequency and Voltage Functions
- Voltage and Frequency Ride Through – Operational Ranges and Modes
- Dynamic Voltage Support – Ranges, Behavior (e.g., reactive-current injection)
- Voltage and Frequency Support – SPF, Volt-Var, Watt-War, Volt-Watt, etc.
- Frequency Control – Frequency-droop (Freq-Watt)
- Return to service criteria and ramp rate control
- Power limiting, export or import controls and thresholds

DTE may request changes to settings, that impact the safety and reliability of the distribution electric system. DTE and the Project shall work together to implement any proposed setting changes.

## **3.24 Installation Approval**

The Applicant must provide DTE with 10 business days of advanced written notice of when the Project will be ready for inspection, testing and approval.

Prior to final approval for Parallel Operation, DTE specified inverter, control or relay calibration settings shall be applied, and a commissioning test must be performed on the Project relaying and control equipment that involves the protection of the DTE electric

system as per the commissioning attachment of the interconnection agreement. The commissioning test must be witnessed by DTE and can be performed by DTE at the Applicant's request. Within 5 business days from receipt of the completed commissioning test report, DTE will notify the Applicant of its approval or disapproval of the interconnection. If DTE does not approve the interconnection, DTE will notify the Applicant of the necessary corrective actions required for approval. The Applicant, after taking corrective action, may request DTE to reconsider the interconnection request.

In the event that revisions are necessary to the Applicant's submitted design and the Applicant submits revised design drawings to DTE, DTE shall either approve, in writing, the Applicant's revised design drawings as resubmitted, or return them to the Applicant with a clear statement as to why they were not approved. Where appropriate, DTE will indicate required changes on the engineering drawings.

In the event the Applicant proposes a revision to DTE's approved relaying and control equipment used to protect the DTE electric system and submits a description and engineering design drawings of the proposed changes, DTE shall either approve the Applicant's amended design drawings or return them to the Applicant with a clear statement as to why they were not approved. Where appropriate, DTE will indicate required changes on the engineering drawings.

### **3.25.1 Telemetry, Disturbance and Power Quality Monitoring Requirements**

Telemetry, disturbance and power quality monitoring is required in all cases for Projects with aggregate nameplate of greater than 1MW or, when indicated by study, or when DTT is required. For Projects that will operate in the Non- Export Mode, the requirement for telemetry, disturbance, and power quality monitoring will be determined on a case-by-case basis as part of the study process.

### **3.25.2 General telemetry requirements**

Telemetry is the collection of operational information from the electric grid. Telemetry can include data such as voltage, amperage, power, and the status of equipment such as circuit breakers and switches. In addition to monitoring the grid, Telemetering equipment also allows to DTE Electric to operate and control the electric grid such as opening and closing circuit breakers or switches. Telemetry is required for DTE Electric to safely and reliably monitor and operate the electric grid.

Interconnection facilities that are rated below 150kWac and are classified as a Level 1 or 2 may not require telemetering. The communications requirement for a Level 1 or 2 facility may only be for revenue metering. Facilities that supply 150kWac or above and are classified as Level 3 or 4 may be required to have a Remote Terminal Unit (RTU). Level 5 projects are required to have an RTU. The RTU aggregates data collected from the interconnection facility and communicates with DTE Electric's Supervisory Control and Data Acquisition (SCADA) system via a telecommunication backhaul network. Where applicable, the interconnection applicant must provide the necessary communication for connections to the DTE Electric RTU and metering equipment.

At the Interconnection applicant's expense, and if applicable, DTE Electric will purchase, configure, install, and commission the RTU. The size and point count of the RTU is determined based on the DER capacity as well as the number of data points to be monitored. DTE Electric will own, operate, maintain, repair, control, alter, replace, and upgrade the RTU. Alternatively DTE may provide an interconnection gateway cabinet with specification included in the construction agreement for the pad, conduit and power supply needs.

An interior location suitable for floor or wall mounting the RTU is required. The location should be reasonably close to the origin of telemetering signals or data concentrator. A control room or relay house

is acceptable as long as the temperature range is within 0C to 70C. The HVAC requirements for fiber optic terminal equipment are more stringent than what is required for RTU equipment. The below outlines required specifications for the RTU:

1. Cable access can be either through the top or bottom of the RTU cabinet or enclosure.
2. Floor space for standard 8-foot tall, 19" free-standing rack.
3. Wall space for a single door enclosure that is 24 inches wide by 16 inches deep by 40 inches high. The wall mount cabinet weighs 60 pounds and is mounted with a 5/16" or 3/8" inch bolt through mounting tabs at each corner.
4. A 120 VAC 15 Amp convenience power source to the RTU cabinet. This source will utilize a dedicated breaker labeled "DTE-RTU". A 4-foot coil is to be left at the RTU location and will be terminated by DTE Electric inside the RTU cabinet.
5. Station DC power 10A @ 48VDC or 5A @ 125VDC (not shared with other equipment) run to the RTU cabinet for RTU power. The circuit breaker shall label "DTE-RTU". If DC power is not available, a 120 VAC circuit may be used as long as this circuit is sourced from an Uninterruptible Power System with a minimum of 8-hour backup.
6. One stranded AWG #8 conductor will be connected to station ground and run to the RTU cabinet by the customer.
7. The customer will run all data signal cables for physical I/O points to the RTU cabinet or to a nearby (6 feet or less) interface cabinet for termination. Data cables must be shielded with shield grounded at RTU end only. Twisted-pair stranded wire between AWG#16 and AWG#22 or twisted-pair solid wire between AWG#18 and AWG#24 may be used. Cables containing 6, 12, 25 and 32 pairs are typical. A 10-foot coil is to be left at the RTU location and will be terminated by DTE Electric inside the RTU cabinet.
8. All analog quantities will be represented by a + / - 1 milliamp or a 4 to 20 milliamp current loop. The current loop may be shared as long as there are no grounds and it is not driven beyond the manufacturers specified limits. Physical status points will be presented by a dry contact available at the interface cabinet. All status points will utilize the Normally Open contacts of the customer provided isolation relay. The RTU will provide the contact wetting voltage.
9. The customer shall provide data communication cables for virtual I/O points directly to the RTU cabinet for termination. Typical data communication cables include standard CAT V (Ethernet) cables, Industrial Ethernet Cable, or Industrial RS-485 Cables such as Belden 3108A or equivalent.
10. Communication between the customer data concentrator and the DTE Electric RTU shall be via appropriate protocol. Other data communication protocols shall be evaluated on a case by case basis.

When required, telemetry, disturbance monitoring, and power quality monitoring will be provided at the Applicant's expense. In addition to other telemetry costs, a one-time charge will be assessed to the Applicant for equipment and software installed at the DTE System Control Center to process the data signals.

### **3.25.3 Telemetry by project Level**

Telemetry enables DTE to operate the electric system safely and reliably under both normal and emergency conditions. DTE measures its internal load plus losses (generation) on a real time basis via an extensive telemetry system. This system sums all energy flowing into the DTE electric system from Projects interconnected to the system and from interconnections with other utilities. During system disturbances when portions of the electrical systems are out of service, it is essential to know if a Project is online or offline to determine the proper action to correct the problem. Time saved during restoration activities translates to fewer outages and outages of shorter duration for the DTE customers.

Facility Rating	DER Capacity	Telemetry Requirements
level 1	<= 20kW	No RTU. Revenue Metering required; generation meter recommended, and generation meter may be required for specific programs. Telemetry may be needed based on study.
level 2	>20kW <= 150kW	No RTU. Revenue Metering required; generation meter recommended, and generation meter may be required for specific programs. Telemetry may be needed based on study.
level 3	>150kW <= 550kW	Revenue Metering required; generation meter strongly recommended, and generation meter may be required for specific programs. Telemetry may be needed based on study.  If RTU is required: <ul style="list-style-type: none"> <li>i. Real and Reactive Power</li> <li>ii. Voltage</li> <li>iii. Relaying Status</li> <li>iv. Breaker Status If DTT is required: <ul style="list-style-type: none"> <li>i. Disturbance Monitoring may be necessary</li> <li>ii. Loss-of-guard (LOG) alarm</li> <li>iii. Receive-trip relay (RTX)</li> <li>iv. Lockout relay</li> </ul> </li> </ul>
level 4	>550kW <= 1MW	Revenue Metering required; generation meter required. Telemetry may be needed based on study.  If RTU is required: <ul style="list-style-type: none"> <li>i. Real and Reactive Power</li> <li>ii. Voltage</li> <li>iii. Relaying Status</li> <li>iv. Breaker Status If DTT is required: <ul style="list-style-type: none"> <li>v. Disturbance Monitoring may be necessary</li> <li>vi. Loss-of-guard (LOG) alarm</li> <li>vii. Receive-trip relay (RTX)</li> <li>viii. Lockout relay</li> </ul> </li> </ul>
level 5	>1MW	Revenue Metering required; generation meter required.  RTU is required: <ul style="list-style-type: none"> <li>I. Real and Reactive Power</li> <li>II. Voltage</li> <li>III. Relaying Status</li> <li>IV. Breaker Status If DTT is required: <ul style="list-style-type: none"> <li>ix. Disturbance Monitoring may be necessary</li> <li>x. Loss-of-guard (LOG) alarm</li> <li>xi. Receive-trip relay (RTX)</li> <li>xii. Lockout relay</li> </ul> </li> </ul>

### 3.25.4 Disturbance Monitoring

Disturbance monitoring allows DTE to evaluate the performance of the overall protective system for all faults on the electric system. It is critical that sufficient monitoring of the protective system is in place to determine its response.

### 3.25.5 Remote Terminal Unit (RTU)

An RTU is required for level 5 projects. An RTU may be required for level 3 and 4 projects

following a system impact study, facilities study, or supplemental study. If the study indicates that the project export capacity exceeds 50% of the annual peak feeder load, or DTT or other remote relaying is required, then an RTU is required.

Telemetry and disturbance monitoring require the installation of a Remote Terminal Unit (RTU), that is supplied, owned, operated, and maintained by DTE. A data Communication Circuit is required for DTE to remotely communicate with the RTU. The Applicant shall provide a suitable location, approved by DTE, for the Applicant to install the RTU and associated equipment. The Applicant shall provide the following external connections and associated equipment to the RTU location, which may include but is not limited to:

1. A 24, 48 V or 125 V DC power supply capable of providing an 8-hour backup. The Applicant shall coordinate with DTE to properly size the DC power supply.
2. A 120 V AC power supply for heating unconditioned (e.g., outdoor) locations and for use with AC/DC converters. The Applicant shall coordinate with DTE to properly size the AC power supply.
3. A control circuit or Communication Interface cable for receiving telemetry and disturbance monitoring statuses.
4. A control circuit or Communication Interface cable to allow the RTU to remotely trip the Project, when remote tripping is required by DTE.
5. An antenna cable for connection to an external antenna. DTE will supply the antenna cable.
6. A communication cable for connection to the Communication Circuit equipment (e.g. Router/Switch).
7. A communication cable for receiving telemetry from DTE metering at the PCC.
8. A voice Communication Circuit, when cellular phone service is not available, for the commissioning and checkout of the metering, DTT and RTU.
9. In some cases where wireless connections are not available or are unreliable, a mast for connection to DTE's wireless communications network may be required.

The above connections shall be connected to the RTU by the Applicant where indicated by DTE in the Interconnection Technical Requirements.

When telemetry is required, the following telemetry values will be monitored on the RTU, unless otherwise specified by DTE:

1. Real and reactive power flow, voltage, etc. from the DTE metering at the PCC.
2. The status (normal/fail) of protective relay Communication Channels. A status indication of "FAIL" indicates the Communication Channel used for relaying is unable to perform its protective function. For example, the direct transfer trip receiver loss of guard (LOG) auxiliary relay.
3. The status (open/closed) of each main interrupting device, each generating interrupting device, and each tie/transfer device used to change the configuration of the Project.

4. If the Project is composed of multiple inverters, a single logical (OR) status of the individual inverter “On/Off” states, indicating all inverters are offline or any one or more inverters are online, is permissible). An “On” status would be indicated if any individual inverter is online.
5. The status indicating battery failure of the DC uninterruptible power supplies providing power to the DTT and RTU equipment.
6. The status of the DTE relays indicating under voltage of the 120V AC power supplies providing power to the DTT and RTU equipment.

The RTU will be equipped with “sequence of events” recording when disturbance monitoring is required. The Applicant shall provide the following disturbance monitoring statuses, unless otherwise specified, to be monitored on the RTU:

1. The trip status of an instantaneous relay to act as a ground fault detector for faults on the DTE electric system. This relay shall be connected into the same sensing source as the ground fault protective relay required by DTE.
2. The status of each interrupting device, which is initiated by the interconnection relaying schemes required by DTE.
3. The status indicating operation of the over/under voltage (27/59) relays.
4. The status indicating operation of the under/over frequency (81O/U) relays.
5. The status indicating operation of the ground fault detection (59N and/or 51N) relays.
6. The status indicating operation of voltage restrained overcurrent (51V) relays.
7. The status indicating operation of the reverse power (32R) relays.
8. The status of the following relays, associated to each individual Direct Transfer Trip receiver, which may include but is not limited to:
  - i. Loss-of-guard relay (LOG).
  - ii. Receive-trip relay (RTX).
  - iii. Lockout relay.

The statuses indicated in the above telemetry items 2 through 5 and disturbance monitoring items shall be provided by the Applicant using one of the following methods specified by DTE:

1. Wiring individual contacts directly to a terminal block near the RTU, or
2. Using a Communication Interface to exchange data with the RTU, or
3. Other communication provisions, acceptable to DTE, to remotely access the multi-functional device such that the operation of the individual functions may be evaluated separately.

### **3.25.6 Power Quality Monitoring**

Power quality monitoring allows DTE to evaluate the quality of power produced by the Project during events that cause an electrical disturbance to DTE customers. The power quality monitoring shall be connected to the DTE metering CTs and VTs located at the PCC. A data

Communication Circuit is required for remote access to the power quality monitoring equipment. The Applicant shall provide a suitable location, unless otherwise specified by DTE, located within five feet from the PCC metering, for DTE to install the utility owned, operated and maintained power quality monitoring equipment. DTE will connect the CT and VT circuits from the PCC metering to the power quality monitoring equipment.

### **3.26 Miscellaneous Operational Requirements**

Miscellaneous requirements include synchronizing, ramp rates, reclose blocking, remote trip capability, reactive power capability and voltage control, frequency control, standby power, and system stability limitations.

#### **3.26.1 Operating in Parallel**

The Applicant will be solely responsible for the required synchronizing equipment and for properly synchronizing the Project with the DTE electric system. Voltage fluctuation at the PCC during synchronizing shall be limited per IEEE 1547-2018.

The Project must be capable of controlling the output of active power (ramp rates) after synchronization to avoid issues on the DTE system, which includes but is not limited to voltage fluctuations, harmonics, or oscillations. The Project shall, upon request by DTE, modify the active power output characteristics to prevent such issues after synchronization. Inverter based Projects connected to the DTE system shall be certified, to be capable of normal and soft ramp rates.

The Project must be designed to prevent the Project from energizing into a de-energized Utility line. The Project's circuit breaker or contactor must be blocked from closing in on a de-energized circuit.

If the Project has shown an unsatisfactory response to requests to separate the generation from the DTE electric system, DTE reserves the right to disconnect the Project. For Projects where telemetry is required, the Applicant shall provide DTE the capability to remotely disconnect the Project if specified in the construction agreement. To provide this functionality, the Project may be required to provide a Communication Interface as defined within these requirements.

#### **3.26.2 Voltage and Frequency Ride Through**

Voltage and frequency ride through are generally not required for synchronous and induction Projects. Certified inverter based Projects are required to meet ride through requirements by implementing the inverter setting criteria defined within these procedures. Non-certified inverter Projects will be reviewed on a case by case basis depending on the available ride through capability.

For inverter based Projects where telemetry is required, the Applicant shall provide DTE the capability to remotely issue ride through settings, including the ability to read information required to manage ride through settings. To provide the functionality, the Applicant shall provide a Communication Interface as defined within these requirements.

All under/over voltage and under/over frequency protective functions installed by the Applicant or DTE are required to coordinate with ride through requirements.

### 3.26.3 Reactive Power Capability and Voltage Control

The Project shall be designed to be capable of maintaining a continuous rated power output for the Export portion of the Project, at a power factor within the range of 0.9 (inject) to 0.97 (absorb) for synchronous, non-synchronous and induction Projects and 0.9 (inject) to 0.9 (absorb) for inverter based Projects. This power factor range standard shall be dynamic and can be met using, for example, power electronics designed to supply this level of reactive capability (considering any limitations due to voltage level, real power output, etc.).

Projects that interconnect within customer-owned facilities must be designed to maintain the above dynamic power factor range for the Export portion of the power delivery.

The Applicant shall control voltage at the PCC in accordance with instructions (e.g. voltage or reactive power schedule) provided by DTE. Inverter based Projects shall be certified, to be capable of controlling the voltage level at the Export portion of the Project using the control modes specified in the following table. The Applicant may request measurement data from the DTE metering in order to control the voltage at the PCC.

<b>Control Mode</b>
Specified Power Factor (SPF)
Voltage-Reactive Power (Volt-VAr)
Active Power- Reactive Power (Watt-Var)
Constant Reactive Power
Voltage-Active Power (Volt-Watt)

For inverter based Projects where telemetry is required, the Project shall provide DTE the capability to remotely issue instructions for voltage control, including the ability to read information required to operate the Project. To provide the functionality, the Applicant shall provide a Communication Interface as defined within these requirements. For non-inverter based projects, the need will be reviewed on a case-by-case basis.

DTE existing rate schedules, incorporated herein by reference, contain power factor adjustments based on the power factor of the metered load at these facilities.

### 3.26.4 Frequency Control

Inverter based Projects shall be certified, to be capable of controlling frequency using the control mode(s) specified in the following table. Non-Export projects are subject to the requirement.

<b>Control Mode</b>
Frequency-Watt

The control modes shall respond to frequency measurements at the inverter terminals. DTE shall provide and specify the control modes and settings applicable to the inverter based Project.

For inverter based Projects where telemetry is required, the Project shall provide DTE the capability to remotely issue instructions for frequency control, including the ability to read information required to operate the Project. To provide the functionality, the Applicant shall

provide a Communication Interface as defined within these requirements. For non-inverter based projects, the need will be reviewed on a case-by-case basis.

### **3.26.5 Standby Power**

Standby power will be provided under the terms of an approved rate set forth in DTE Standard Rules and Regulations. The Applicant should be aware that to qualify for Standby Rates, a separate meter must be installed at the generator.

### **3.26.6 System Stability and Site Limitations**

Many locations on DTE's electrical grid have a stiffness ratio of 1; this means that electrical coincidence projects may be spread over a larger area of the grid than a grid with a higher stiffness ratio.

The Stiffness Ratio is the combined three-phase short circuit capability of the Project and the utility system divided by the short circuit capability of the Project measured at the PCC. A stability study may be required for Projects with a Stiffness Ratio of less than 40. Five times the generator rated kVA will be used as a proxy for short circuit current contribution for induction generators. For synchronous Projects, with a Stiffness Ratio of less than 40, DTE requires special generator trip schemes or loss of synchronism (out-of-step) relay protection. If the apparent voltage flicker from a loss-of-synchronism condition exceeds 5%, an out-of-step relay will be required. This type of protection is typically applied at the PCC and trips the entire Project off-line, if instability is detected, to protect the DTE electric system and its customers. If the Applicant chooses not to provide for mitigation of unacceptable voltage flicker (above five percent), DTE may disallow the interconnection of the Project or require a new dedicated interconnection at the Applicant's expense.

The Applicant is responsible for evaluating the consequences of unstable generator operation or voltage transients on Project equipment and determining, designing, and applying any relaying which may be necessary to protect that equipment. This type of protection is typically applied on individual generators to protect the Project facilities.

DTE will determine if operation of the Project will create objectionable voltage flicker and/or disturbances to other DTE customers and develop any required mitigation measures at the Applicant's expense.

## **3.27 Revenue Metering Requirements**

DTE will own, operate, and maintain the billing metering equipment at the Applicant's expense.

### **3.27.1 Non-Export Projects**

A DTE bi-directional meter will be installed that only records energy deliveries to the Project. Generation metering will be used for DTE operations purposes.

### **3.27.2 Export Projects**

The billing metering may need to be replaced. A dedicated data Communication Circuit is required to allow remote access to the billing meter by DTE. If telemetry is required, the

billing metering will be connected to the RTU as part of the installation. The Applicant shall provide a suitable location, approved by DTE, for DTE's owned, operated, and maintained billing metering. The Applicant shall provide DTE access to the premises at all times to install, turn on, disconnect, inspect, test, read, repair, or remove the metering equipment. The Applicant may, at its option, have a representative witness this work.

The metering installations shall be constructed in accordance with the practices, which normally apply to the construction of metering installations for commercial, industrial, or other customers with demand recording equipment. At a minimum two meters will be required; one at the PCC, and one at the generator. For Projects with multiple generators, metering of each generator may be required. When practical, multiple generators may be metered at a common point provided the metered quantity represents only the gross generator output.

DTE shall supply to the Applicant all required metering equipment and the standard detailed specifications and requirements relating to the location, construction, and access of the metering installation and will provide consultation pertaining to the meter installation as required. DTE will endeavor to coordinate the delivery of these materials with the Applicant's installation schedule during normal scheduled business hours.

The Applicant shall provide a mounting surface for the meters, recorders, connection cabinets, a housing for the instrument transformers that meets DTE safety standards, a conduit for the conductors between the instrument transformer secondary windings and the meter connection cabinets, and a conduit for the communication links, if required. All of this equipment must meet DTE specifications and requirements as specified in the SIM manual.

The responsibility for the installation of the equipment is shared between DTE and the Applicant, with the Applicant generally installing all of the equipment on its side of the PCC, including instrument transformers, cabinets, conduits, and mounting surfaces. DTE, shall install the meters, recorders, and communication circuits. DTE will endeavor to coordinate the installation of these items with the Applicant's schedule during normal scheduled business hours.

Projects that participate in utility or market programs must additionally meet the metering requirements of those programs including any requirements for real time telemetry without conflict with the DTE revenue and generation metering.

Where applicable, separate metering of station power may be required to accurately meter the generation facility load when the Project is off-line.

Additional metering may be required for specific Company programs or for market participation.

### **3.27.3 Participation in FERC jurisdictional programs (e.g. MISO-managed programs and other aggregation programs)**

An applicant who does not install a generation meter may not be eligible for participation in FERC jurisdictional programs (e.g. MISO-managed programs or other aggregation programs). Eligibility will be determined by the relevant requirements and is not within DTE Electric's control. Applicants are urged to consider this before determining the configuration of their system. DTE Electric will provide the generation meter if the Applicant determines they want to participate in these programs at a future date.

## 3.28 Communication Requirements

### 3.28.1 Communication Interface

A Communication Interface allows for the exchange of data between the DTE RTU (or alternate) and the Project interface equipment. The data may include but is not limited to generator monitoring and control points, disturbance monitoring, and telemetry. When required, the Applicant shall provide an interface capable of exchanging data with the DTE RTU over one of the following protocols using the associated transports and physical layers, as defined by DTE on a case-by-case basis. The Project shall provide a single communication cable to a location near the RTU panel or gateway cabinet.

Protocol	Transport	Physical Layer
IEEE Std 2030.5 (SEP2)	TCP/IP	Ethernet
IEEE Std 1815 (DNP3)	TCP/IP	Ethernet
Sunspec Modbus	TCP/IP	Ethernet
	N/A	RS-485

Table - Approved Protocols / Transport / Physical Layer

DTE will provide the necessary interface information (e.g. data mapping) containing the required monitoring and control functionality. The Applicant and DTE shall work together to implement the Communication Interface.

### 3.28.2 Communication Circuits

Data Communication Circuits allow for the remote exchange of data between DTE and equipment located at the Project. Telemetry, disturbance monitoring, power quality monitoring, DTT, metering and pilot relaying generally require the use of data Communication Circuits. The Applicant is responsible for all costs including but not limited to materials, installation, operating, telecommunication, maintenance, cancellation fees and monthly charges for the data Communication Circuits.

DTE will determine the quantity and type (e.g. cellular, fiber, radio) of the data Communication Circuits required for the application. DTE will determine the requirements for the data communication circuits based on the parameters of the project including the location on the system, proximity to other utility assets and the protection, telemetry and control requirements. DTE will provide one or more options to the Applicant Which may include utility owned circuits or acceptable leased data communication circuits In the cases that the Applicant may be required by DTE to order and acquire the leased data Communication Circuits. DTE will provide information (e.g. costs, availability) regarding leased data Communication Circuits once made available by the telecommunication provider. DTE is not responsible for any delays caused by the telecommunication provider in providing such information or increased interconnection costs.

Data Communication Circuits require the installation of equipment at the Project that is accessible to DTE and the telecommunication provider. The Applicant shall provide a suitable location, approved by DTE, for the Applicant and/or telecommunication provider to install any necessary Communication Circuit equipment and sufficient space for any DTE equipment, risers, antennas, or supporting infrastructure as specified in the construction agreement or design. A review of each installation shall be made to determine the location and space requirements most agreeable to DTE and the Applicant. DTE will provide the utility information

necessary for proper installation of the equipment. The required equipment will vary based on the type of Communication Circuit. For wireless applications, the required equipment may include but is not limited to coaxial cables, conduits, antennas, surge arresters, cabinets, AC and DC power sources and mounting structures. Wired connections may require the Applicant to install equipment that may include but is not limited to backboards, splice boxes, patch panels, wire, fiber, AC and DC power sources, interface converters, cabinets, conduits, raceways and mounting structures. The Applicant and DTE shall work together to install the data Communication Circuit.

DTE personnel require the use of cellular phone service while performing checkout of the metering, DTT, RTU, and relaying. The Applicant must provide an alternative voice communication method, approved by DTE, when cellular phone service is not available. All copper and fiber Communication Circuits must be properly protected as detailed in IEEE Std. 487 and IEEE Std 1590, respectively.

### **3.29 EV interconnection / Vehicle to Grid**

EV systems that are capable of parallel operation with the grid shall require an interconnection and the nameplate of the inverter will be used for purposes of determining the DER Capacity, Export Capacity may be used where applicable if limited by an acceptable means of power limiting as defined in these procedures. EV interconnection shall follow the standard interconnection procedures and requirements.

DTE defines Vehicle to Grid as any EV system capable of paralleling with electrical system even if momentarily. DTE considers Vehicle to Home, if parallel operation is possible, to be indistinguishable from Vehicle to Grid for purposes of requiring an interconnection application. Automatic transfer-trip or similar non-export technology is required to avoid paralleling with the grid.

EV or EVSE Systems that are incapable in any way of operating a source of potential parallel to the grid and use an appropriate isolation means utilizing open transition, shall not require an interconnection and will be considered similar to an isolated backup generator. These systems may be required to provide information on their configuration if they are present with other DER at the site or to qualify for programs.

Back feed from an EV charger operating bi-directionally into a grid outage is strictly prohibited for safety reasons.



## **APPENDIX B: COSTS**

### **Interconnection Table – Applicant Costs Levels 1 and 2**

#### **Combined Rider 18 Interconnection Table – Applicant Costs**

	Application
Level 1	\$50
Level 2	\$50

#### **Non-Rider 18, Certified DERs, Interconnection Table – Applicant Costs**

	Non-Export Track*	Fast Track Initial Review*	Fast Track Supplemental Review	Study Track
Level 1	\$100 + \$1/kWac	\$100 + \$1/kWac	\$1,000	\$300
Level 2	\$100 + \$1/kWac	\$100 + \$1/kWac	\$1,000	\$300

\* When System Impact Study or Facilities Study are necessary for Non-Export, or Fast Track projects, the studies will follow the respective costs in the Study Track row and the Interconnection Table – Study Costs below.

#### **Non-Rider 18, Non-Certified DERs, Interconnection Table – Applicant Cost**

See Interconnection Procedures for Level 3,4 and 5

#### **Interconnection Table – Study Costs**

	System Impact Study	Facilities Study
Level 1	\$0*	\$1,000*
Level 2	\$0*	\$2,500*

\*For level 1 and 2 projects system impact and facilities studies are combined

When they are determined to be necessary the following supplemental study fees will be clearly indicated on the System Impact study agreement or Facilities study agreement as part of the total fee to be paid for that study phase.

#### **Interconnection Table – Additional Study Costs by Type**

Reinspection fee	\$100
Telecommunications study	\$1,500

## **APPENDIX C: PROCEDURE DEFINITIONS**

**AC:** means alternating current at 60 Hertz.

**Affected system:** means another electric utility's distribution system, a municipal electric utility's distribution system, the transmission system, or transmission system- connected generation which may be affected by the proposed interconnection.

**Alternative electric supplier:** means that term as defined in section 10g of 1939 PA 3, MCL 460.10g.

**Applicant:** means the person or entity submitting an interconnection application, a legacy net metering program application, or a distributed generation program application. An applicant is not required to be an existing customer of an electric utility. An electric utility is considered an applicant when it submits an interconnection application for a DER that is not a temporary DER or a substation backup energy storage device.

**Application:** means an interconnection application, a legacy net metering program application, or a distributed generation program application.

**Area network:** means a location on the distribution system served by multiple transformers interconnected in an electrical network circuit.

**Business day:** means Monday through Friday, starting at 12:00:00 a.m. and ending at 11:59:59 p.m., excluding electric utility holidays and any day where electric service is interrupted for 10% or more of an electric utility's customers.

**Calendar day:** means every day, including Saturdays, Sundays, and holidays.

**Certified:** means an inverter-based system has met acceptable safety and reliability standards by a nationally recognized testing laboratory in conformance with IEEE 1547.1-2020 and the UL 1741 September 28, 2021 edition except that prior to commercial availability, inverter-based systems which conform to the UL 1741SA September 7, 2016 edition are acceptable.

**Commission:** means the Michigan Public Service Commission.

**Commissioning test:** means the test and verification procedure that is performed on a device or combination of devices forming a system to confirm that the device or system, as designed, delivered, and installed, meets the interconnection and interoperability requirements of IEEE 1547-2018 and IEEE 1547.1-2020. A commissioning test must include visual inspections and may include, as applicable, an operability and functional performance test and functional tests to verify interoperability of a combination of devices forming a system.

**Conforming:** means the information in an interconnection application is consistent with the general principles of distribution system operation and DER characteristics.

**Customer:** means a person or entity who receives electric service from an electric utility's distribution system or a person who participates in a legacy net metering or distributed generation program through an alternative electric supplier or electric utility.

**DC:** means "direct current."

**Distributed energy resource:** or “DER” means a source of electric power and its associated facilities that is connected to a distribution system. DER includes both generators and energy storage devices capable of exporting active power to a distribution system.

**DER Capacity:** The aggregate capacity of the site in real power (W) using the nameplate rating in AC. For inverter-based DERs, this shall be based on the nameplate AC rating of the inverter(s) or the nameplate capacity of the generation and storage, whichever is lesser.

**Distributed generation program:** means the distributed generation program approved by the commission and included in an electric utility’s tariff pursuant to section 6a(14) of 1939 PA 3, MCL 460.6a, or established in an alternative electric supplier distributed generation program plan.

**Distribution system:** means the structures, equipment, and facilities owned and operated by an electric utility to deliver electricity to end users, not including transmission and generation facilities that are subject to the jurisdiction of the federal energy regulatory commission.

**Distribution upgrades:** mean the additions, modifications, or improvements to the distribution system necessary to accommodate a DER’s connection to the distribution system.

**Electric utility:** means any person or entity whose rates are regulated by the commission for selling electricity to retail customers in this state.

**Electrically coincident:** means that 2 or more proposed DERs associated with pending interconnection applications have operating characteristics and nameplate capacities which require that distribution upgrades will be necessary if the DERs are installed in electrical proximity with each other on a distribution system.

**Electrically remote:** means a proposed DER is not electrically coincident with a DER that is associated with a pending interconnection application.

**Eligible electric generator:** means a methane digester or renewable energy system with a generation capacity limited to 110% of the customer’s electricity consumption for the previous 12 months.

**Energy storage device:** means a device that captures energy produced at one time, stores that energy for a period of time, and delivers that energy as electricity for use at a future time. For purposes of these rules, an energy storage device may be considered a DER.

**Export capacity:** means the amount of power that can be transferred from the DER to the distribution system. Export capacity is either the nameplate rating or a lower amount if limited using an acceptable means that is defined in an electric utility’s interconnection procedures.

**Facilities study:** means a study to specify and estimate the cost of the equipment, engineering, procurement, and construction work if distribution upgrades or interconnection facilities are required.

**Fast track:** means the procedure used for evaluating a proposed interconnection that makes use of screening processes, as described in R 460.944 to R 460.950.

**Grid network:** means a configuration of a distribution system or an area of a distribution system in which each customer is supplied electric energy at the secondary voltage by more than 1 transformer.

**High voltage distribution:** means those parts of a distribution system that operate within a voltage range specified in the electric utility's interconnection procedures. For purposes of these rules, the term "subtransmission" means the same as high voltage distribution.

**IEEE:** means Institute of Electrical and Electronics Engineers.

**IEEE 1547:** means "IEEE Standard for Interconnection and Interoperability of Distributed Energy Resources with Associated Electric Power Systems Interfaces,"

**IEEE 1547.1** means IEEE "Standard Conformance Test Procedures for Equipment Interconnecting Distributed Energy Resources with Electric Power Systems and Associated Interfaces"

**Inadvertent export:** means unscheduled export of active power from a DER, exceeding a specified magnitude and for a limited duration, due to fluctuations in load- following behavior.

**Inadvertent export susceptible capacity:** means the maximum electric capacity which a DER may introduce to the distribution system during an inadvertent export event, which may differ from either the nameplate or the inverter rating, depending on the configuration.

**Initial review:** means the fast track initial review screens described in R 460.946.

**Interconnection:** means the process undertaken by an electric utility to construct the electrical facilities necessary to connect a DER with a distribution system so that parallel operation can occur.

**Interconnection agreement:** means an agreement containing the terms and conditions governing the electrical interconnection between the electric utility and the applicant or interconnection customer. Where construction of interconnection facilities or distribution upgrades are necessary, the agreement, or amendments, shall specify estimated timelines, cost estimates, and payment milestones for construction of facilities and distribution upgrades to interconnect a DER into the distribution system, and shall identify design, controls, settings, procurement, installation, and construction requirements associated with installation of the DER. Standard level 1, 2, and 3 interconnection agreements and level 4 and 5 interconnection agreements are types of interconnection agreements.

**Interconnection coordinator:** means a person or persons designated by the electric utility who shall serve as the point of contact from which general information on the application process and on the affected system or systems can be obtained through informal request by the applicant or interconnection customer.

**Interconnection customer:** means the person or entity, which may include the electric utility, responsible for ensuring a DER is operated and maintained in compliance with all local, state, and federal laws, as well as with all rules, standards, and interconnection procedures. An electric utility is not considered an interconnection customer for temporary DER or a substation backup energy storage device project.

**Interconnection facilities:** mean any equipment required for the sole purpose of connecting a DER with a distribution system.

**Interconnection procedures:** means the requirements that govern project interconnection adopted by each electric utility and approved by the commission.

**Interconnection study agreement:** means an agreement between an applicant and an electric utility for the electric utility to study a proposed DER.

**kW:** means kilowatt.

**kWac:** means the electric power, in kilowatts, associated with the alternating current output of a DER at unity power factor.

**kWh:** means kilowatt-hours.

**Legacy net metering program:** means the true net metering or modified net metering programs in place prior to commission approval of a distributed generation program tariff pursuant to section 6a(14) of 1939 PA 3, MCL 460.6a, and prior to the establishment of an alternative electric supplier distributed generation plan.

**Level 1:** means a certified project of 20 kWac or less.

**Level 2:** means a certified project of greater than 20 kWac and not more than 150 kWac.

**Level 3:** means a project of 150 kWac or less that is not certified, or a project greater than 150 kWac and not more than 550 kWac.

**Level 4:** means a project of greater than 550 kWac and not more than 1 MWac.

**Level 5:** means a project of greater than 1 MWac.

**Level 4 and 5 interconnection agreement:** means an interconnection agreement applicable to level 4 and 5 interconnection applications.

**Limited export:** means the exporting capability of a DER whose export capacity is limited by means specified in an electric utility's interconnection procedures.

**Low voltage distribution:** means those parts of a distribution system that operate with a voltage range specified in the electric utility's interconnection procedures.

**Mainline:** means a conductor that serves as the three-phase backbone of a low voltage distribution circuit.

**Material modification:** means a modification to the DER nameplate rating, DER export capacity, electrical size of components, bill of materials, machine data, equipment configuration, or the interconnection site of the DER at any time after receiving notification by the electric utility of a complete interconnection application. Replacing a component with another component that has near-identical characteristics does not constitute a material modification when agreed to by the electric utility. For the proposed modification to be considered material, it shall have been reviewed and been determined to have or anticipated to have a material impact on 1 or more of the following:

The cost, timing, or design of any equipment located between the point of common coupling and the DER.

The cost, timing, or design of any other application.

The electric utility's distribution system or an affected system.

The safety or reliability of the distribution system.

**Methane digester:** means a renewable energy system that uses animal or agricultural waste for the production of fuel gas that can be burned for the generation of electricity or steam.

**MW:** means megawatt.

**MWac:** means the electric power, in megawatts, associated with the alternating current output of a DER at unity power factor.

**Nameplate rating:** means the sum total of maximum rated power output of all a DER's constituent generating units and energy storage units as identified on the manufacturer nameplate, regardless of whether it is limited by any approved means. Nameplate rating includes all of the following:

- Nominal voltage (V).
- Current (A).
- Maximum active power (kWac).
- Apparent power (kVA).
- Reactive power (kvar).

**Nationally recognized testing laboratory (NRTL):** means any testing laboratory recognized by the accreditation program of the United States Department of Labor Occupational Safety and Health Administration.

**Network protector:** means those devices associated with a secondary network used to automatically disconnect a transformer when reverse power flow occurs.

**Non-export:** An installed electric generation project which operates in parallel with the electric utility with a relay protection scheme and isolating device preventing energy flow back to the utility.

**Non-export track:** means the procedure for evaluating a proposed interconnection that will not inject electric energy into an electric utility's distribution system.

**Parallel operation:** means the operation, for longer than 100 milliseconds, of a DER while connected to the energized distribution system.

**Point of common coupling (PCC):** means the point where the DER connects with the electric utility's distribution system.

**Power Control System (PCS):** means systems or devices that electronically limit or control steady state currents to a programmable limit.

**Project:** Electrical generating equipment and associated facilities that are not owned or operated by an electric utility.

**Radial supply:** means a configuration of a distribution system or an area of a distribution system in which each customer can only be supplied electric energy by 1 substation transformer and distribution line at a time.

**Readily available:** means no creation of data is required, and little or no computation or analysis of data is required.

**Renewable energy system:** Term as defined in section 11(i) of 2008 PA 295, MCL 460.1011(i).

**Secondary network:** means those areas of a distribution system that operate at a secondary voltage level and are networked.

**Site:** means a contiguous site, regardless of the number of meters at that site. A site that would be contiguous but for the presence of a street, road, or highway is considered to be contiguous for the purposes of these rules.

**Spot network:** means a location on the distribution system that uses 2 or more inter-tied transformers to supply an electrical network circuit, such as a network circuit in a large building.

**Standard level 1, 2, and 3 interconnection agreement:** means the statewide interconnection agreement approved by the commission and applicable to levels 1, 2 and 3 interconnection applications. A cover sheet including modifications to address any special operating conditions may be added.

**Study track:** The procedure used for evaluating a proposed interconnection utilizing a system impact study and facilities study “Supplemental review” means the fast track supplemental review screens described in R 460.950.

**Supplemental review:** The fast track supplemental review screens.

**System impact study:** means a study to identify and describe the impacts to the electric utility’s distribution system that would occur if the proposed DER were interconnected exactly as proposed and without any modifications to the electric utility’s distribution system. A system impact study also identifies affected systems.

**Temporary DER:** means a DER that is installed on the distribution system by the electric utility with the intention of not operating at the site permanently.

**UL:** means Underwriters Laboratory.

**UL 1741:** means the September 28, 2021 edition of “Standard for Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources,”

**UL 1741 CRD for PCS:** means the Certification Requirement Decision for Power Control Systems for the standard titled Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources, March 8, 2019.

## **APPENDIX D: INTERCONNECTION APPLICATION**

[INSERT APPLICATION]

**APPENDIX E: SYSTEM IMPACT STUDY AND FACILITIES  
STUDY AGREEMENTS**

[INSERT SYSTEM IMPACT STUDY AND FACILITIES STUDY AGREEMENT]

**APPENDIX F: INTERCONNECTION AND PARALLEL  
OPERATING AGREEMENT**

[INSERT INTERCONNECTION AND PARALLEL OPERATING AGREEMENT]

## **APPENDIX G: CONTACT LIST**

## **APPENDIX H: INITIAL REVIEW SCREENS**

Application Review Screens will be utilized during the application process and are used to inform applicants of an application deficiency or inconsistency or may indicate a critical issue that would prevent compatibility with the DTE Electrical System. These screens include review of the one-line and three-line diagrams for compliance with DTE's SIM and consistency between the site plan, equipment information and application submission materials and a review of the customer information and contact information for accuracy.

Design and Safety Screens will be utilized throughout the process if conditions are noted that will introduce safety or design incompatibilities or if other process such as method of service are required before the interconnection can continue.

Additional screens for specific program participation will be contained in program specific procedures.

The initial review screens are all of the following:

- i. The entire proposed DER, including all aggregated site generation and point or points of interconnection, must be located within the electric utility's service territory.
- ii. For interconnection of a proposed DER to a radial distribution circuit, the aggregated export capacity, including the proposed DER, on the circuit may not exceed 15% of the line section annual peak load as most recently measured or calculated if measured data is not available. A line section is that portion DTE's distribution system connected to a customer bounded by automatic sectionalizing devices or the end of the distribution line. The electric utility shall consider 100% of applicable loading, if available, instead of 15% of line section peak load for level 1 and 2 DER. This screen does not apply to level 1 non-export and level 2 non-export DER applications".
- iii. For interconnection of a proposed DER to the load side of network protectors, the proposed DER must utilize an inverter-based equipment package and, together with the aggregated other inverter-based DERs, may not exceed the smaller of 5% of a network's maximum load or 50 kWac. The DER must not provide reverse power flow into the network protector under any conditions.
- iv. The proposed DER, in aggregation with other DERs on the distribution circuit, may not contribute more than 10% to the distribution circuit's maximum fault current at the point on the primary voltage nearest the proposed point of common coupling, based on nameplate rating. This screen does not apply to level 1 applications, except in situations where the addition of the DER would render the protection scheme inoperable and to be modified to be able to continue to operate as designed.
- v. The proposed DER, in aggregate with other DERs on the distribution circuit, may not cause any distribution protective devices and equipment or interconnection customer equipment on the system to exceed 87.5% of the short circuit interrupting capability, based on nameplate rating. An interconnection may not be proposed for a circuit that already exceeds 87.5% of the short circuit interrupting capability. Distribution protective devices and equipment include, but are not limited to, substation breakers, fuse cutouts, and line reclosers. This screen does not apply to level 1 applications except in situations where the addition of the DER would require the interrupting equipment to be modified to not improperly operate.
- vi. If the type of electrical service provided to the applicant, including line configuration and the transformer winding and connection limits the potential of the DER creating over-voltages on the electric utility's distribution system due to a loss of ground during the operating time of any anti-islanding function or during any fault condition. Projects implementing 3 phase ganged isolation that operate on ground detection, loss of phase detection, open phase detection or 3V0 protection and isolating may be reviewed to determine if they pass the screening.

Primary Distribution Line Type	Type of Interconnection to Primary Distribution Line	Result
3-phase, 3 wire	3-phase or single phase, phase-to-phase	Pass screen
3-phase, 4 wire	3-phase or single-phase, line-to-neutral	Pass screen
3-phase, 4 wire	3-phase or single phase, phase-to-phase	Fail screen

- vii. If the proposed DER is to be interconnected on single-phase shared secondary, the aggregate export capacity on the shared secondary, including the proposed DER export capacity, may not exceed 20 kWac or 65% of the transformer nameplate rating.
- viii. If the proposed DER is single-phase and is to be interconnected on a center tap neutral of a 240 volt service, its addition may not create an imbalance between the 2 sides of the 240 volt service of more than 20% of the nameplate rating of the service transformer.
- ix. If the proposed DER is single-phase and is to be interconnected to a 3-phase service, its nameplate rating may not exceed 10% of the service transformer nameplate rating.
- x. If the proposed DER's point of common coupling is behind a line voltage regulator, the aggregate DER on the line section plus the proposed DER's nameplate rating must be less than 250 kWac or the regulator rating, whichever is less. This screen does not include substation voltage regulators.
- xi. The aggregate DER export capacity on the line section plus the proposed DER export capacity, subject to inadvertent export screens, shall not exceed the day to day thermal limit of any distribution system component that serves the project or exceed the rated fault current limit of DTE equipment.
- xii. The project follows the DTE Service Installation Manual (SIM), Primary Service, Method Of Service (MOS) requirements and meets all requirements of electrical service.
- xiii. High voltage resonance screen. If the project is located on a delta ungrounded line, there must not be a single phase protective device upstream of the DER and any capacitors on the same line section.
- xiv. A three phase project must not have a single phase operating and isolation device at the POC/PCC
- xv. If the project intends to operate as an islanded microgrid, it must implement a single open break isolation wholly contained within the Applicant's service, such as an Auto Transfer Switch, implement mechanical interlocks that do not allow parallel operation or implement a hardware breaker controlled by DTE approved relaying. The microgrid must not rely on software based controls to manage power flow at the Point of Common Coupling during island operation. The microgrid must also implement open transition return to grid and follow return to service criteria or have appropriate synchronization relaying and controls approved by DTE for closed transition and provide SCADA points to DTE for required relaying.
- xvi. If the application is a subdivided premise in a master planned clustered development where the aggregate DER Capacity of the clustered development exceeds the interconnection level the application has applied for, the application will be evaluated with the context of the development's aggregate planned DER capacity.
- xvii. If the project is located within a section of a circuit that is identified as an area that has an operational jumpering or loop scheme, the addition of the DER does not render the jumpering or loop scheme inoperable due to loading or voltage violations.

### Anti Islanding screens

The following are the anti-islanding screens:

- i. For synchronous and induction type projects at Levels 3 - 5, DTE will determine whether the total generation within a protective zone is greater than 33% of the

minimum utility load that could be isolated along with the generation. In cases where it can be shown that self-excitation of the induction generator cannot occur when isolated from the DTE electric system, DTE may waive the requirement.

- ii. For inverter-based Projects at all Levels, DTE will determine whether the total generation within a protective zone is greater than two thirds of the minimum utility load that could be isolated along with the generation or whether synchronous generation accounts for greater than 25% of the inverter-based supply.

For all levels, if a project fails either (i) or (ii) above (as applicable), DTE will conduct a risk of islanding study as a supplemental study. Projects which fail the risk of islanding study may be required to install methods to mitigate this risk. The study process and acceptable methods are described in Section 3.16.

### **Inadvertent export screens**

To be eligible for the Fast Track, projects with export-limiting functionality enabled utilizing either certified inverters with PCS or a standalone PCS shall be screened as set forth below. Projects which fail any of the below screens will be subject to supplemental review or study. Any such studies will take into account the inverter's actual open loop response time (to the extent ascertainable) and will not assume an open loop response time of 30 seconds unless no actual response time can be determined.

- For all projects, inadvertent export shall be limited to no more than 30 seconds, as required for certification.
- For the purposes of the below “shared infrastructure” and “dedicated infrastructure” screens, “inadvertent-export-susceptible capacity” for a given DER shall mean the maximum electric capacity which a DER may introduce to the distribution system during an inadvertent export event, which may differ from either the nameplate or the inverter rating, depending on the configuration. The inadvertent-export-susceptible capacity of any DER employing relays to prevent inadvertent export shall be deemed to be zero.
  - Shared infrastructure screens:
    - For projects with an inadvertent-export-susceptible capacity of up to 20 kWac, the aggregate inadvertent-export-susceptible capacity of the proposed project, plus the existing aggregate inadvertent export-susceptible capacity of DERs interconnected on shared infrastructure, shall not exceed 300% of the lowest day-to-day system equipment rating on the shared infrastructure.
    - For projects with an inadvertent-export-susceptible capacity greater than 20 kWac, the aggregate inadvertent-export-susceptible capacity of the proposed project, plus the existing aggregate inadvertent-export-susceptible capacity of DERs interconnected on the shared infrastructure, shall not exceed 200% of the lowest day-to-day system equipment rating on the shared infrastructure.
    - No single project's inadvertent-export-susceptible capacity may exceed 200% of the lowest day-to-day system equipment rating on the shared infrastructure.
  - Dedicated Infrastructure Screens:

- For projects with an inadvertent-export-susceptible capacity of 1 MWac or less, the total inadvertent-export-susceptible capacity of such project shall not exceed 200% of the lowest day-to-day system equipment rating on the dedicated secondary circuit.
  - For projects with an inadvertent-export-susceptible capacity above 1 MWac, the total inadvertent-export-susceptible capacity shall not exceed 120% of the lowest day-to-day system equipment rating on the dedicated secondary circuit.
- Voltage variation shall not exceed 5% from inadvertent export measured at the transformer or point of shared secondary for secondary connected projects or 3% measured at the point of connection on the primary for primary connected projects, based on Formula 1 below. If Relay protected DER are present, the full capacity of the relay protected project(s) shall be used for assessing voltage impacts, but limited to the duration of the relay operation based on its settings.

Formula 1:

<b>Formula</b>	$\frac{(R_{SOURCE} \times \Delta P) - (X_{SOURCE} \times \Delta Q)}{V^2}$
<p><b>Where:</b></p> <p><math>\Delta P = (\text{DER apparent power Nameplate Rating} - \text{Export Capacity}) \times \text{PF}</math>,  <math>\Delta Q = (\text{DER apparent power Nameplate Rating} - \text{Export Capacity}) \times \sqrt{(1 - \text{PF}^2)}</math>,  <math>R_{SOURCE}</math> is the grid resistance, <math>X_{SOURCE}</math> is the grid reactance,  <math>V</math> is the grid voltage, PF is the power factor</p>	

## **APPENDIX I: SUPPLEMENTAL REVIEW SCREENS**

The supplemental review screens are all of the following:

**Minimum load screen.** Where 12 months of line section minimum load data, including onsite load but not station service load served by the proposed DER, are available, can be calculated, can be estimated from existing data, or can be determined from a power flow model, the aggregate DER capacity on the line section must be less than 100% of the minimum load for all line sections bounded by automatic sectionalizing devices upstream of the proposed DER. If minimum load data are not available, or cannot be calculated, estimated, or determined, DTE shall include the reason or reasons that it is unable to calculate, estimate, or determine minimum load in its supplemental review results notification. All of the following must be applied:

- (i) The type of generation used by the proposed DER will be considered when calculating, estimating, or determining circuit or line section minimum load relevant for the application of the minimum load screen specified in this subdivision. Solar photovoltaic generation systems with no energy storage must use daytime minimum load. All other generation must use absolute minimum load unless an operating schedule is provided.
- (ii) When this screen is being applied to a DER that serves some station service load, only the net injection of electric energy into the electric utility's distribution system may be considered as part of the aggregate generation.
- (iii) The electric utility shall not consider as part of the aggregate generation, for purposes of this supplemental screen, DER capacity known to be already reflected in the minimum load data.

**Voltage and power quality screen.** In aggregate with existing generation on the line section, all of the following conditions must be met:

- (i) The voltage regulation on the line section can be maintained in compliance with relevant requirements under all system conditions.
- (ii) The voltage fluctuation is within acceptable limits as defined by the IEEE Standard 1453-2015, IEEE Recommended Practice for the Analysis of Fluctuating Installations on Power Systems.

ii.

**Safety and reliability screen.** The location of the proposed DER and the DER capacity on the line section may not create impacts to safety or reliability that require application of the study track to address. DTE shall consider all of the following when determining potential impacts to safety and reliability in applying this screen:

- (i) Whether the line section has significant minimum loading levels dominated by a small number of customers, such as several large commercial customers.
- (ii) Whether the loading along the line section is uniform.
- (iii) Whether the proposed DER is located less than 0.5 electrical circuit miles for less than 5 kV or less than 2.5 electrical circuit miles for greater than 5 kV from the substation. In addition, the day to day thermal rating of the line section from the substation to the point of common coupling.
- (iv) If the proposed interconnection will connect to a power line or feeder cable
- (v) Whether the proposed DER incorporates a time delay function to prevent reconnection of the DER to the distribution system until distribution system voltage and frequency are within normal limits for a prescribed time.
- (vi) Whether operational flexibility is reduced by the proposed DER, such that transfer of the line section or sections of the DER to a neighboring distribution circuit or substation may trigger overloads, power quality issues, or voltage issues.
- (vii) Whether the proposed DER employs equipment or systems certified by a recognized standards organization to address technical issues including, but not limited to, islanding, reverse power flow, or voltage quality.
- (viii) Whether the proposed project will increase existing power quality issues on the circuit.

- (ix) Whether voltage regulators, or load tap changers are adversely impacted or risk being damaged by reverse power flow from over excitation, excessive operation or improper regulation behavior leading to their failure or power quality and voltage impacts to other customers.
- (x) Whether the service at the premise is able to operate safely with the additional generation provided by the project.
- (xi) Whether the service or transformer could experience an overload or out of range voltage when there are other existing projects on the same service transformer.
- (xii) Whether there is a risk of islanding screen to determine if additional protection, communications or operating devices are required to prevent unintentional islanding.

**APPENDIX J: PRE-APPLICATION REPORT FORM**

## APPENDIX K: VOLTAGE RANGES

Voltage Class	Nominal Voltage (V)
Secondary	120/240
	120/208
	240
	277/480
	480
Distribution	4,800
	8,320
	13,200
Sub transmission	24,000
	41,570 (40KV)

## **APPENDIX L: COMPANY HOLIDAYS**

New Year's Day (observed)

Martin Luther King Day

Good Friday

Memorial Day

Independence Day

Labor Day

Thanksgiving

Day after Thanksgiving

Christmas Eve (observed)

Christmas Day (observed)

New Year's Eve (observed)

## **APPENDIX M: PRE APPLICATION REPORT**

An Applicant shall submit a completed pre-application report form (**Appendix J**) only if they desire to do so for level 1 or 2, it is not required or recommended. It is required for any proposed level 4 or 5 project. A pre-application report fee will be required (**Appendix B**). DTE provides the following in its pre-application reports if the following is existing and readily available, otherwise it will be indicated as such on the report:

1. The substation bus, bank, or circuit most likely to serve the proposed point of common coupling (PCC). This identification does not necessarily indicate that this would be the circuit to which the project would ultimately connect.
2. The total capacity, in MWac, of the substation bus, bank, or circuit based on normal or operating ratings likely to serve the proposed PCC.
3. The existing aggregate generation capacity, in MWac, interconnected to a substation bus, bank, or circuit likely to serve the proposed PCC.
4. The aggregate generation capacity, in MWac, of DER not yet built, but found in previously accepted interconnection applications, for a substation bus, bank, or circuit likely to serve the proposed PCC.
5. The portion of both existing capacity and capacity found in previously accepted interconnection applications, in MWac, that is susceptible to inadvertent export for any shared circuit likely to serve the proposed PCC.
6. The available capacity, in MWac, of the substation bus, bank, or circuit likely to serve the proposed PCC.
7. The substation nominal distribution voltage.
8. The nominal distribution circuit voltage as the proposed PCC.
9. The label, name, or identifier of the distribution circuit on which the proposed PCC is located.
10. The approximate circuit distance between the proposed PCC and the substation.
11. The actual or estimated peak load and minimum load data at any relevant line section or sections, including daytime minimum load and absolute minimum load, when available. If not readily available, the report must indicate whether the generator is expected to exceed minimum load on the circuit.
12. Whether the point of common coupling is located behind a line voltage regulator and whether the substation has a load tap changer.
13. Limiting conductor ratings from the proposed point of common coupling to the distribution substation.
14. Number of phases available at the primary voltage level at the proposed point of common coupling, and, if a single phase, distance from the 3-phase circuit.
15. Whether the point of common coupling is located on a spot network, area network, grid network, radial supply, or secondary network.
16. Based on the proposed PCC, whether power quality issues may be present on the circuit.
17. Whether or not the area has been identified as having a prior affected system. (for example Transmission system impacts).
18. Whether or not the site will require a system impact study for high voltage distribution based on size, location, and existing system configuration.

DTE will process pre-application report requests in the order in which they are received. Pre-application reports will be provided within 20 business days of receipt of the completed request form and payment of the fee. Any pre-application reports produced by DTE are non-binding and do not confer any rights on the applicant.

An applicant may request additional pre-application reports, including different proposed PCCs for the same project. No more than 10 pre-application reports may be submitted by an applicant and its affiliates during a 1-week period.

**DTE Electric**

**MICHIGAN ELECTRIC UTILITY**

**Generator Interconnection**

**Procedures**

**Level 3, 4 & 5 Projects**

**with DER Capacity**

**Greater Than 150 kWac or any**

**Non-Certified Application**

*November 6, 2025*

# INTRODUCTION

## Level 3, 4 & 5

This Generator Interconnection Procedure document outlines the process & requirements used to install or modify generation projects with DER Capacity ratings greater than 150 kWac (nameplate) and non-certified projects of any size designed to operate in parallel with the DTE Electric Company (DTE or the Company) electric system. Technical requirements (data, equipment, relaying, telemetry, metering) are defined according to generation type, location of the interconnection, and mode of operation (Export or Non-Export). The process is designed to provide an expeditious interconnection to the DTE electric system that is both safe and reliable.

This document has been filed with the Michigan Public Service Commission (MPSC) and complies with rules established for the interconnection of parallel generation to the DTE electric system in the MPSC Order in Case No. 20890

The term "Project" will be used throughout this document to refer to electric generating equipment and associated facilities that are not owned or operated by DTE. The term "Applicant" means a person or entity submitting an interconnection application, a legacy net metering program application, or a distributed generation program application. An applicant is not required to be an existing customer of an electric utility. An electric utility is considered an applicant when it submits an interconnection application for a DER that is not a temporary DER.

This document does not address other Project concerns such as environmental permitting, local ordinances, or fuel supply. Nor does it address agreements that may be required with DTE and/or the transmission provider, or state or federal licensing, to market the Project's energy. An interconnection request does not constitute a request for transmission service.

It may be possible for DTE to adjust the requirements stated herein on a case-by-case basis. The review necessary to support such adjustments, however, may be extensive and may exceed the costs and timeframes established by the MPSC and addressed in these procedures. Therefore, if requested by the Applicant, adjustments to these procedures will only be considered if the Applicant agrees in advance to compensate DTE for the added costs of the necessary additional reviews and to also allow DTE additional time for the additional reviews.

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# INTERCONNECTION PROCEDURES

## 1. INTERCONNECTION PROCESS

### 1.1 Customer Project Planning Phase

An Applicant may contact DTE before or during the application process regarding the project. DTE can be reached by phone, e-mail, or by the external website to access information, forms, rates, and agreements. DTE requires a pre-application report to be completed for Level 4 or greater projects.

*An interconnection process flow diagram can be found in Appendix A.*

Interconnection fees can be found in **Appendix B**. Procedure definitions can be found in **Appendix C**.

### 1.2 Pre-Application Report

An Applicant shall submit a completed pre-application report form (**Appendix J**) for any proposed level 4 or 5 project. A pre-application report fee will be required (**Appendix B**). DTE provides the following in its pre-application reports if the following is existing and readily available, otherwise it will be indicated as such on the report:

1. The substation bus, bank, or circuit most likely to serve the proposed point of common coupling (PCC). This identification does not necessarily indicate that this would be the circuit to which the project would ultimately connect.
2. The total capacity, in MWac, of the substation bus, bank, or circuit based on normal or operating ratings likely to serve the proposed PCC.
3. The existing aggregate generation capacity, in MWac, interconnected to a substation bus, bank, or circuit likely to serve the proposed PCC.
4. The aggregate generation capacity, in MWac, of DER not yet built, but found in previously accepted interconnection applications, for a substation bus, bank, or circuit likely to serve the proposed PCC.
5. The portion of both existing capacity and capacity found in previously accepted interconnection applications, in MWac, that is susceptible to inadvertent export for any shared circuit likely to serve the proposed PCC.
6. The available capacity, in MWac, of the substation bus, bank, or circuit likely to serve the proposed PCC.
7. The substation nominal distribution voltage.
8. The nominal distribution circuit voltage as the proposed PCC.
9. The label, name, or identifier of the distribution circuit on which the proposed PCC is located.
10. The approximate circuit distance between the proposed PCC and the substation.
11. The actual or estimated peak load and minimum load data at any relevant line section or sections, including daytime minimum load and absolute minimum load, when available. If not readily available, the report must indicate whether the generator is expected to exceed minimum load on the circuit.
12. Whether the point of common coupling is located behind a line voltage regulator and whether the substation has a load tap changer.
13. Limiting conductor ratings from the proposed point of common coupling to the

distribution substation.

14. Number of phases available at the primary voltage level at the proposed point of common coupling, and, if a single phase, distance from the 3-phase circuit.
15. Whether the point of common coupling is located on a spot network, area network, grid network, radial supply, or secondary network.
16. Based on the proposed PCC, whether power quality issues may be present on the circuit.
17. Whether or not the area has been identified as having a prior affected system. (for example Transmission system impacts)
18. Whether or not the site will require a system impact study for high voltage distribution based on size, location, and existing system configuration.

DTE will process pre-application report requests in the order in which they are received. Pre-application reports will be provided within 20 business days of receipt of the completed request form and payment of the fee. Any pre-application reports produced by DTE are non-binding and do not confer any rights on the applicant.

An applicant may request additional pre-application reports, including different proposed PCCs for the same project. No more than 10 pre-application reports may be submitted by an applicant and its affiliates during a 1-week period.

### **1.3 Application Review & Track Assignment**

The Applicant must first submit an Interconnection Application (**Appendix D**) to DTE. A separate application is required for each Project, or Project site and for any subsequent changes to a site after approval, if such changes are deemed a material modification after a material modification review under Section 1.13. If a single Project contains multiple types of DER, include all DER in a single application form. Applications may require additional information necessary to comply with MISO reliability and modelling requirements as applicable. An applicant shall complete a submittal of the required interconnection application and interconnection filing fee per the table in **Appendix B**.

Documentation of site control must be submitted with the application by the Applicant. For level 3 or greater DERs, site control may be demonstrated by providing documentation that shows any of the following:

- Ownership of, a leasehold interest in, or a right to develop a site for the purpose of constructing and operating the DER.
- An enforceable option to purchase or acquire a leasehold site for this purpose.
- A legally binding agreement transferring a present real property right to specified real property along with the right to construct and operate a DER on the specified real property for a period of time not less than 5 years.

In addition to the DER Capacity of the site, an Applicant is required to provide the desired export capacity in the application if it is less than the DER Capacity. Export capacity for a Project shall be defined by using one of the accepted power limiting methods found in the interconnection technical requirements section.

DTE will aggregate all proposed generation and storage on a site in determining project level. If there is existing DER at the site, DTE may conduct a review to determine if proposed changes constitute a material modification (as defined in the Material Modification procedures) to existing generation. If so, DTE may include existing generation and storage on a site when

aggregating generation to determine project level. For inverter-based DERs, capacity for determining the project Level shall be based on the lesser of either the total nameplate capacity of generation and storage equipment connected to the inverter(s) or the nameplate AC rating of the inverter(s).

Within 10 business days of receipt of the completed application, a pre-application report for level 4 or 5 applications, and Interconnection application payment DTE will notify the Applicant if the Interconnection Application is conforming, incomplete or non-conforming. If any portion of the Interconnection Application, data submittal (site plan and one-line diagrams, etc), or filing fee is incomplete and/or missing; DTE will provide a written list of all deficiencies to the Applicant with explanations via PowerClerk. The Applicant shall provide a modified application within 60 business days from the date the Applicant was notified by DTE that the application was incomplete, with up to 2 resubmissions being permitted during this time period for the Applicant to resolve the deficiencies. After each submission of information, DTE will notify the Applicant within 10 business days that the interconnection application is either accepted, or rejected due to continuing deficiencies. If the Applicant does not meet the timelines required, the application may be withdrawn.

Once DTE has accepted the application, DTE will notify the Applicant that the application is complete and accepted, and whether the Project will be processed following the non-export track, fast track, or study track. The applicant may indicate on the application that they wish to proceed directly to non-export or study track.

For projects applying for interconnection and applying for participation in a specific Tariff or market program, additional procedures and requirements may be required in addition to these procedures will be present in program or tariff specific procedures.

#### **1.4 Non-Certified Equipment**

Projects with Non-certified inverter-based equipment shall proceed to the study track if they do not implement a supplemental relay protection system, as they are not eligible for fast track or non-export track. These projects may submit complete documentation of a separate relay and breaker system that implements IEEE1547 compliant protection to be considered for fast track and non-export track which will include a supplemental protection review. Non-certified synchronous or induction equipment are not eligible for fast track. These projects may submit complete documentation of a separate relay and breaker system that implements IEEE1547 compliant protection to be considered for fast track which will include a supplemental protection review.

To expedite processing, specific inverter models that appear on the current California Energy Commission's list for certified equipment (<https://www.energy.ca.gov/programs-and-topics/programs/solar-equipment-lists>) will be considered certified.

Proposing the use of an inverter that is not on the CEC list requires the submission in the application of the appropriate UL1741 certification document for the current active supplement version that matches the exact model being utilized and additional supporting information to accurately represent the inverter in the application. Failure to produce the UL certification or discrepancies in the documentation may result in the application being placed on hold while DTE reviews the provided documentation.

#### **1.5 Non-Export Track**

The non-export track is available to all projects that will not inject electric energy into the distribution system or have inadvertent export and that have an existing electrical service at the applicant's premise. In order to be eligible for the non-export study process the Project is

required to submit a three line protection diagram and proposed to install reverse power flow (32) relaying or other method acceptable to DTE together with any other protection function, communication or control as determined by DTE for the safety of customers, and the reliable operation of the electrical system as defined within these interconnection procedures technical requirements. Within 20 business days of providing notice of an approved application, DTE will perform a study using the initial review screens in **Appendix H** to determine the suitability of the interconnection equipment for the non-export track and provide the results to the Applicant.

If the results indicate that no interconnection facilities, distribution upgrades, further study, or Project modifications are required, DTE will provide specifications within 20 business days for any equipment required to be installed by the Applicant. DTE may provide required coordination with the utility, settings for the installed protective equipment, inverters or other devices that need to be configured and validated prior to commissioning. DTE reserves the right to revise those settings as needed. Within 10 business days of receiving the equipment specifications, the Applicant shall notify DTE whether it will proceed to an Interconnection and Operating Agreement or will withdraw the application. The failure of the Applicant to notify DTE within the required time period shall result in the application being withdrawn.

If the results indicate further study is required, DTE will present options and the Applicant shall decide whether to proceed to a supplemental review under the fast-track process, the study track, facilities study, or to withdraw the application. The Applicant shall have 10 business days to decide on a course of action and notify DTE, otherwise the application may be withdrawn.

If a Project modification is offered by DTE, the Applicant shall either withdraw the interconnection application or provide a modified application within 60 business days from the date the Applicant was notified by DTE, with up to 2 resubmissions during this time period to provide a modified application. After each submission of information, DTE will notify the applicant within 10 business days that the interconnection application is either accepted or rejected due to continuing deficiencies. After accepting the modified application, DTE will have 20 business days to reapply the screens to determine if the modified application mitigates or eliminates the issues that caused the failure of the screens. If the Applicant does not meet the timelines required, the application may be withdrawn.

When an Applicant changes from a non-exporting system to an exporting system, or from an exporting to a non-exporting system, the Applicant shall submit a new interconnection application.

## **1.6 Fast Track**

The fast track is available to projects up to 5 MWac for consideration to connect to the 13.2 kV distribution system and 1 MW (level 4) for any distribution system less than 13.2 kV, Sub transmission (24KV, 40KV and greater) projects are not eligible for fast track. Projects proposing to use limited export and using an acceptable method for limiting export as defined in Section 3.12 are eligible for fast track. If an acceptable method for limiting export is utilized, the capacity used for screening shall be the export capacity unless otherwise stated in the screen. Depending on the method utilized, the inadvertent export screens in **Appendix H** initial review screens may also apply. An Applicant may choose to forgo the fast track for an eligible project and proceed directly to the study track.

DTE will aggregate all proposed generation and storage on a site in determining fast track eligibility. DTE may conduct a review to determine if proposed changes to the site constitute a material modification to existing generation or storage. If so, DTE may include existing generation and storage on a site when aggregating generation to determine fast track eligibility.

Within 20 business days of providing notice of an approved application, DTE will perform a study using the initial review screens in **Appendix H** to determine the suitability of the interconnection equipment and provide the results.

If the proposed interconnection passes the initial review screens, or if the proposed interconnection fails the screens but DTE determines that the DER may be interconnected consistent with safety, reliability, and power quality standards, DTE shall notify the Applicant and inform the Applicant whether the Project will proceed to Facilities Study or directly to Interconnection and Operating Agreement.

If the proposed interconnection fails any of the initial review screens, and DTE does not or cannot determine that the DER may be interconnected consistent with safety, reliability, and power quality standards, DTE shall notify the Applicant and provide the Applicant with the results of the application of the initial review screens. DTE shall provide the Applicant with the options to attend a customer options meeting, proceed to Supplemental Review, submit a project modification, or withdraw the application.

The Applicant shall have 10 business days to decide on a course of action and notify DTE, otherwise the application shall be withdrawn. If the Applicant decides to submit a project modification, after the modified application is accepted, the initial review screen process will be repeated.

Upon the Applicant's request, DTE and the Applicant shall schedule a customer options meeting between DTE and the Applicant to review possible facility modifications, screen analysis, and related results to determine what further steps are needed to permit the DER to be connected safely and reliably to the distribution system. The customer options meeting must take place within 30 business days of the date of notification. DTE shall provide the Applicant with the options of proceeding to Supplemental Review, proceeding to the Study Track, submitting a project modification, or withdrawing the application. The Applicant shall have 20 business days to decide on a course of action and notify DTE, otherwise the application shall be withdrawn. The customer options meeting may take place in person or via telecommunications.

If a Project modification is offered by DTE, the Applicant shall either withdraw the interconnection application, or provide a modified application within 60 business days from the date the Applicant was notified by DTE, with up to 2 resubmissions being permitted during this time period for the Applicant to provide a modified application.

The application modifications must mitigate or eliminate the factors that caused the interconnection application to fail 1 or more of the initial review screens. After each submission of information, DTE will notify the applicant within 10 business days that the interconnection application is either accepted or rejected due to continuing deficiencies. After accepting the modified application, DTE will have 20 business days to reapply the screens to determine if the modified application mitigates or eliminates the issues that caused the failure of the screens. If the Applicant does not meet the timelines required, the application may be withdrawn.

## **1.7 Supplemental Review**

An applicant shall submit payment of the supplemental review fee (**Appendix B**) within 20 business days of agreeing to a supplemental review. If payment of the fee has not been received by DTE within 25 business days, the application shall be withdrawn.

Within 30 business days after the applicant pays the applicable supplemental review fee, DTE will perform a study using the supplemental review screens in **Appendix I** and notify the applicant of the results.

If the proposed interconnection passes the supplemental review screens, or if the proposed interconnection fails the screens but DTE determines that the DER may be interconnected consistent with safety, reliability, and power quality standards, DTE shall notify the Applicant and inform the Applicant whether the Project will proceed to Facilities Study or directly to Interconnection and Operating Agreement.

If the proposed interconnection fails any of the supplemental review screens, and DTE does not or cannot determine that the DER may be interconnected consistent with safety, reliability, and power quality standards, DTE shall notify the Applicant and provide the Applicant with the results of the application of the supplemental review screens.

DTE shall provide the Applicant with the options to proceed to the Study Track or withdraw the application. The Applicant shall have 10 business days to decide on a course of action and notify DTE, otherwise the application shall be withdrawn.

## 1.8 Study Track

The study track is available to all Projects that are not eligible for the non-export track, or the fast track. A Project that is eligible for the fast track may also select to skip fast track and be evaluated in the study track directly. Projects that do not pass the initial review screens or supplemental review screens or are otherwise identified to require further study while proceeding through the non-export track may also be evaluated in the study track. Projects requiring a Pre Application must complete the pre application process before proceeding to study track.

At the present time DTE only plans to conduct individual studies but reserves the right to define and implement an alternate study method.

DTE shall provide a study agreement to the Applicant within 10 business days after the interconnection application has been accepted, or within 10 business days after the applicant has notified DTE to proceed to the study track, as applicable. The study agreement will indicate the required fees as defined in **Appendix B**. In Summary, the Study Track will be used if any of the following conditions apply:

- (a) The DER is not eligible for the non-export track or fast track.
- (b) The DER did not pass the initial review screens as part of the fast track and the applicant selected the study track option in the customer options meeting.
- (c) The DER did not pass 1 or more supplemental review screens.
- (d) The DER was evaluated under the non-export track and further study is required.
- (e) The DER is eligible for the fast track, but the applicant elected the study track.

If a project begins in another track and is moved to the study track for any other reason listed above, within 10 business days after the Applicant has notified DTE to proceed to the study track, DTE shall provide a study agreement to the Applicant.

## 1.9 Study Process

Upon receipt of a signed Study agreement and required payment. DTE will proceed to study each Project in the order in which the Projects were placed into the study track, taking into account withdrawn interconnection applications and electrically remote Projects. An electrically remote Project in an individual study may be studied on an expedited schedule relative to electrically coincident DERs. Electrically remote DERs will be studied in the order the interconnection applications were deemed complete. Projects that are on hold for missing data or other issues shall not delay the processing of any other application.

Upon request of the Applicant, a scoping meeting shall be scheduled to discuss the interconnection application and review existing fast track results, if any. The scoping meeting must take place within 20 business days after the interconnection application is considered complete by DTE or, if applicable, the fast track has been completed and the Applicant has elected to continue with the system impact study or facilities study. DTE will indicate if the project will proceed to System Impact Study, Facilities Study or will proceed directly to an Interconnection Agreement. The scoping meeting is limited to one hour and DTE may cover multiple projects with the Applicant in the same meeting.

If a Project in study is delayed due to an affected system issue, other Projects that were placed into the study track on a later date may continue to progress.

An Applicant that withdraws from the study may reapply with a new interconnection application.

A full study will begin in the System Impact Study and proceed to Facilities Study. DTE may indicate that a System Impact study is not needed, and a project can proceed directly to Facilities Study, or after reviewing the results of the System impact study determine that a Facilities Study is needed. If only a Facilities study is needed, the entry point into the process is indicated below in the Facility Study Agreement Phase.

The Study process, excluding affected system delays, holds waiting for data, company holidays and storm, is as follows:

#### System Impact Study Agreement (maximum 30 business days)

- DTE will provide a System Impact Study Agreement within 10 business days
- The applicant will have 20 business days to return the signed agreement with the required fee. If notice is not received by the end of this 20 business day period the application may be withdrawn by DTE.

#### System Impact Study Phase (maximum 60 business days)

- DTE will perform the System Impact study within 60 business days and provide written results to the Applicant at the completion of this phase and indicate if a Facilities Study is required and required study fees based on **Appendix B**.
- DTE may request additional data from the applicant within the first 20 business days of the study

#### First Decision Phase (maximum 85 business day)

- Within 15 business days of receiving the System Impact study report the

Applicant shall choose to proceed to a facilities study if required by the System Impact Study, request a facilities study review meeting or withdraw.

- DTE will have up to 25 business days to conduct the review meeting and will present options based on the result of the System Impact study
- After the review meeting the Applicant will have up to 45 business days to withdraw the project, proceed to facilities study, if required, or proceed with execution of interconnection agreement, if applicable. If notice is not received by the end of this 45 business day period the application may be withdrawn by DTE.

#### Facilities Study Agreement (maximum 30 business days)

- DTE will provide a Facilities Study Agreement within 10 business days.
- The applicant will have 20 business days to return the signed agreement with the required fee.

#### Facilities Study Phase (maximum 80 Business Days)

- DTE will have 80 business days to complete the facilities study and provide written results to the Applicant at the completion of this phase.
- DTE shall also offer to hold a conference call with the Applicant to discuss the written results, to occur within 30 days of the end of the study phase to the extent feasible.

#### Second Decision Phase (maximum 55 Business Days)

- Within 10 days the Applicant shall choose to proceed with execution of interconnection agreements, request a facilities study review meeting or withdraw.
- DTE will have up to 25 business days to conduct the review meeting
- The Applicant will have up to 20 business days to proceed with execution of interconnection agreement after the review meeting. If notice is not received by the end of this 20 business day period the application may be withdrawn by DTE.

### **1.9.1 System Impact Study**

DTE will provide the Applicant with a system impact study agreement within five business days of entering the study track either directly after an application is deemed complete or after a Project moves to the study track from another track. The Applicant shall return the completed system impact study agreement, provide any additional technical data requested by DTE, and pay the required fee as indicated on the Study agreement (**Appendix E**) within 20 business days. DTE may require generator dynamic model information to comply with MISO modelling requirements.

DTE may consider the application withdrawn if the system impact study agreement, payment, and required technical data are not returned within 20 business days.

The system impact study report will identify and describe the electric system impacts that would result if the proposed Project were interconnected without electric system modifications. It will also provide a non-binding, good faith list of facilities that are required as a result of the application and non-binding estimates of costs and time to construct these facilities. The system impact study may also indicate that additional study is needed during the Facilities study phase to determine the appropriate upgrades.

DTE will complete the system impact study and provide both a system impact study and, if necessary, a facilities study agreement within 60 business days of receipt of the signed system impact study agreement, payment of all applicable fees, and any necessary technical data.

DTE may request reasonable additional data from the Applicant within 20 business days of beginning the system impact study.

DTE and the Applicant shall work together to resolve the additional data request so that DTE will be able to complete the system impact study within the aforementioned 60 business day period.

If the Applicant does not provide the requested additional data in a timely manner, DTE will notify the Applicant that the system impact study is on hold and the date the hold started. DTE will resume work on the study when the additional data is received.

Within 15 business days of receiving the system impact study report, the Applicant shall notify DTE whether it elects to pursue a system impact study review meeting, proceed to Facilities Study, or withdraw the application. If the Applicant fails to notify DTE within 15 business days, DTE may consider the application to be withdrawn.

Upon request by Applicant, a system impact study review meeting shall be scheduled to review system impact study results and determine what further steps are needed to permit the Project to be connected safely and reliably to the distribution system. The system impact study review meeting must take place within 25 business days of DTE receiving notification that the Applicant plans to attend a system impact study review meeting. At the meeting DTE will offer the Applicant to proceed to Facilities Study, proceed directly to Interconnection & Operating Agreement if the utility determines a Facilities study is not needed, or withdraw the application. If an applicant fails to notify DTE of its selection within 45 business days of the meeting, DTE may consider the application to be withdrawn.

### **1.9.2 Facilities Study**

If a Project received a system impact study and it indicated a Facilities study was required, DTE will provide the Applicant with a facilities study agreement with the system impact study report. If no system impact study was performed, DTE will provide a facilities study agreement within 10 business days of proceeding to Facilities Study. The Applicant shall return the signed facilities study agreement and pay the required facilities study fee as indicated on the Facilities Study Agreement (**Appendix E**) within 20 business days. DTE may withdraw the application if the facilities study agreement and payment are not returned within 20 business days.

The facilities study report will specify and estimate the cost of the required equipment, engineering, procurement, and construction work, including overheads, needed to interconnect the Project, and an estimated timeline for the completion of construction.

DTE will complete the facilities study and provide a facilities study report to the Applicant within 80 business days of the receipt of the signed facilities study agreement and payment of the facilities study fee.

Within 10 business days of receiving a facilities study report from DTE, the Applicant shall notify DTE whether it elects to pursue a facilities study review meeting, proceed to an Interconnection & Operating Agreement, or withdraw the application. If the Applicant fails to notify DTE within 10 business days, DTE may consider the application to be withdrawn.

Upon request by Applicant, a facilities study review meeting shall be scheduled to review facilities study results and determine what further steps are needed to permit the Project to be connected safely and reliably to the distribution system. The facilities study review meeting must take place within 25 business days of DTE receiving notification that the Applicant plans to attend a facilities study review meeting. At the meeting DTE will offer the Applicant to proceed to Interconnection & Operating Agreement or withdraw the application. If an applicant fails to notify DTE of its selection within 20 business days of the meeting, DTE may withdraw the application.

### 1.9.3 Cost Allocation Methodology

In the case that two or more projects agree to share the costs identified during the facilities study per the Interconnection and Distributed Generation Standards established in Case No. 21117:

*Rule 70. Costs for interconnection facilities and distribution upgrades must be classified into one of the following categories:*

*(a) Site-specific costs, which include, but are not limited to, costs of interconnection facilities and distribution upgrades that are caused by one DER, whether that DER is electrically co-incident with other DERs. These costs must be assigned to the cost-causing applicant.*

*(b) Shared interconnection facilities costs, which are costs caused by DERs which together necessitate the construction of interconnection facilities. The interconnection facilities costs that should be shared must be allocated to each applicant based on a methodology described in the electric utility's interconnection procedures.*

*(c) Shared distribution upgrade costs, which are costs caused by electrically co-incident DERs that together necessitate a distribution upgrade. The distribution upgrade costs that should be shared must be allocated to each applicant based on a methodology described in the electric utility's interconnection procedures.*

The decision to share costs must be made and mutually agreed to in writing during the overlapping study or decision period.

Shared interconnection facilities shall be split equally amongst Applicants whose Projects necessitate the shared interconnection facilities. Once an Applicant's Project interconnection facilities are in service, the upfront original cost to install those interconnection facilities can no longer be shared by future Applicants. Costs of ongoing ownership, maintenance, and future repair/replacement can still be shared by future applicants that share the interconnection facilities in accordance with interconnection agreements.

Shared distribution upgrade costs shall be allocated according to the impact of each applicant's generator on the limits exceeded for the shared distribution facilities. A simple example is shown below for a thermal constraint. The same methodology would be used for voltage, interrupting capability, or other constraints.

Limit Exceeded	Distribution Upgrade Cost	Impact of Project A	Impact or Project B
Loading on line X exceeded limit by 5 MVA	line X upgrade (\$1M)	3 MVA	2 MVA
Cost Allocation		$=(3/5*\$1M)=\$0.6M$	$=(2/5*\$1M)=\$0.4M$

Distribution upgrade costs to be paid by Applicants that have agreed to interconnection agreements will not be considered for cost allocation to subsequent applicants, unless requested and agreed to by all applicants affected.

Distribution upgrade costs and allocations of costs are subject to change due to the potential for an Applicant to withdraw up until an Applicant's Project is in service and costs are reconciled per the interconnection agreements. DTE shall endeavor to notify an Applicant as soon as possible after it becomes aware that an Applicant's cost for distribution upgrades is dependent on or changes due to any other Applicant withdrawing a Project or Projects.

#### **1.9.4 Affected System Study Process**

If during a System Impact Study or a Facilities Study DTE determines that another utility's system, or Bulk Electric System, may be affected by a proposed interconnection project, DTE shall notify the applicant and Affected System of such and place the Project in an on hold status in regards to all interconnection study timelines while an affected system study is completed. DTE shall send notification and information on the project to the affected system owner. While DTE will coordinate with the Affected System Owner, it is the applicant's responsibility to request that an affected system study be completed and respond to any associated costs or request for information from the Affected System Owner and for any scope, costs, and lead times of any upgrades required on the affected system. Once DTE receives the affected system study results from the affected system owner, the results will be incorporated into the DTE study report, the hold will be removed from the Project and the interconnection timelines will resume.

#### **1.10 Interconnection and Operating Agreement**

An interconnection agreement will be provided to the Applicant in this stage. An Applicant shall pay the actual cost of the interconnection facilities and distribution upgrades, subject to R 460.964 (8).

DTE will provide its interconnection agreement within 3 business days of reaching this stage for level 3 projects that have no construction, and within 5 business days for level 3 projects with construction and 15 business days for level 4 and 5 projects. The interconnection agreement may define modifications needed to address special operating conditions. When construction of interconnection facilities or distribution upgrades is necessary, the interconnection agreement will contain a construction attachment that details the timelines for completion of activities and estimates of construction costs or a timetable when these requirements can be determined. The applicant and DTE will mutually agree on the timing of construction milestones and any operating or coordination that needs to be scheduled. The construction attachment to the interconnection agreement will include a payment schedule that corresponds to the milestones established.

The Applicant shall sign and return the interconnection agreement with payment, if applicable, within 30 business days of receiving the agreement. If this deadline is missed, the Applicant will be informed of the missed deadline and granted an extension of 15 business days. If the interconnection agreement and payment are not received during the 15-business-day extension, DTE may consider the interconnection application withdrawn.

DTE will countersign and provided a completed copy of the interconnection agreement within 10 business days of the Applicant returning a mutually agreed-upon and signed interconnection agreement.

The Interconnection agreement will also contain the terms for parallel operation authorization that the Applicant will agree to. DTE will sign the Parallel Operation Authorization after the Applicant has successfully completed commissioning and met all terms in the interconnection agreement and its attachments.

### **1.11 Inspection, Testing, and Commissioning**

The Applicant is required to notify DTE when the installation of a Project and any required local code inspection and approval is complete. The Applicant is also required to complete any telecommunications, Cybersecurity, data exchange or remote control installation and complete any test reports, certification or configuration documents as defined in the Interconnection Agreement or Construction Agreement attachment prior to notification.

DTE will review the Applicant's inspection, test reports, or configuration documents and communicate its intent to perform a witness or commissioning test, or waive its rights to perform a witness test and commissioning test, within 10 business days.

The commissioning testing required by DTE, may include but is not limited to, confirmation of installed equipment, functional testing, and verification of protection and control system settings. DTE will provide the utility settings and commissioning test requirements prior to witness testing. The Applicant is responsible for applying DTE requirements prior to the date of witness testing and may request temporary parallel authorization if needed to apply and confirm the requirements.

If DTE finds the Applicant's inspection, test reports, or configuration documents to be incomplete, insufficient, or unsatisfactory, DTE shall provide the reasons for doing so in writing and the Applicant shall have not less than 20 business days or a mutually agreed upon timeframe with DTE to implement corrections to those documents. The Applicant, after taking corrective action, shall request DTE to reconsider the inspection, test reports, or configuration documents.

Subsequent to the successful completion of the above requirements, DTE will do the following:

- If DTE intends to witness or perform a commissioning test, the tests must be performed within 20 business days for a level 3 project and within a mutually agreed upon timeline for level 4 and 5.
- If DTE waives its right to visit the site and inspect the Project or perform the commissioning tests, it will provide a written waiver to the Applicant within 10 days of receiving notice. The Applicant shall provide DTE with the completed commissioning test report within 20 business days of receipt of this waiver.

If DTE attempts to conduct the inspection and testing at the arranged time and is unable to access the Project or complete the testing, the Project must remain disconnected until the Applicant and DTE can complete the inspection and testing.

If DTE witnessed or performed commissioning tests and inspected the Project, within 5 business days of receipt of the completed commissioning test report, DTE will notify the Applicant it has accepted or rejected the commissioning test report and if it has found the site to be satisfactory. If the commissioning test is accepted and the site is found satisfactory, DTE will notify the Applicant, and the Project will proceed to Authorization to Operate in Parallel.

If DTE waived its right to witness or perform commissioning tests and inspect the Project, within

5 business days of receipt of the completed commissioning test report, DTE will notify the Applicant it has accepted or rejected the commissioning test report. If the commissioning test is accepted, DTE will notify the Applicant, and the Project will proceed to Authorization to Operate in Parallel.

If DTE rejects a commissioning test or finds a site unsatisfactory, it will provide its reasons for doing so in writing, and the Applicant has 20 business days to implement corrections. The Applicant, after taking corrective action, shall request DTE to reconsider its findings. Do note that the Applicant may be billed the actual cost of any re-inspections.

If the Applicant does not notify DTE that the Project is installed and ready to test, DTE may, in writing, query the status of the Project. If the Applicant does not provide a written response within 10 business days or no progress is evident, DTE may consider the Project withdrawn.

### **1.12 Authorization to Operate in Parallel**

DTE will provide the Applicant with written authorization to operate in parallel with DTE within five business days of all of the following conditions being met:

- DTE notified the Applicant that the commissioning test and inspection, where applicable, are accepted.
- The Applicant complied with all applicable parallel operation requirements as set forth in these procedures and the applicable interconnection agreement.
- The Applicant complied with all applicable local, state, and federal requirements.
- DTE has received payment in full for all outstanding bills.

Upon satisfactory completion of all requirements, testing and commissioning, DTE shall issue a Parallel Operating Authorization that incorporates any ongoing requirements, terms or conditions that were defined in the interconnection agreement and construction agreement.

With this written authorization, the Project is considered approved for parallel operation, the Project may begin operating, and the Applicant is considered an interconnection customer.

The Applicant shall not operate its Project in parallel with DTE's distribution system without prior written permission to operate from DTE. Subject to reasonable timing and other conditions, including completion of conditions in the applicable interconnection agreement or these procedures, DTE will allow for reasonable, but limited, testing before written authorization has occurred.

### **1.13 Material Modification Process**

A Material Modification is a modification to the DER nameplate rating, DER Export capacity, electrical size of components, bill of materials, machine data, equipment configuration, or the interconnection site of the DER at any time after receiving notification by DTE of a complete interconnection application. Modification requests shall be submitted through PowerClerk, and as part of this process, DTE will update the project status in PowerClerk at each process step or change.

Examples of modifications that are not material would be like-for-like equipment changes including inverters or panels with the same nameplate rating and electrical characteristics that replace an existing DER component. This could occur, for example, in the case of a damage or failure where the original part is no longer available on the market, or if the specified component as originally applied for is no longer available and a new component that is the same electrically is available prior to interconnection and where settings, configuration, the nameplate DER capacity,

Export Capacity and connections are unchanged. that is damaged or failed. DTE is obligated to keep accurate records of DER that are interconnected with the electrical system and may request relevant data to update DER interconnection records for non-material modifications to update PowerClerk, or request verification that the appropriate control settings have been applied to systems that have non-material modifications. Regardless of the determination of material or non-material, modifications may trigger a request from DTE for updated generator modeling information or a dynamic model update from the Project to comply with MISO system and Dynamic modeling requirements.

At any point after an interconnection application is considered accepted but before the signing of an interconnection agreement, the applicant may propose modifications to the interconnection application. The applicant shall submit to DTE, through PowerClerk, all proposed modifications to any information provided in the interconnection application, and DTE shall perform an evaluation to determine whether the proposed modification is a material modification. The screening and study timelines specific to any particular interconnection application must be placed on hold while the proposed modification is being evaluated by DTE. DTE will provide the evaluation results of the material modification determination to the applicant through PowerClerk within 10 business days of the Applicant's submission of a Material Modification request. As part of these evaluation results, and if the proposed material modifications are compatible with the DTE electrical system, DTE may provide options for performing a re-study of the material modifications. DTE shall not be required to accept or implement a modification to the DTE distribution system or generation assets that are proposed by an applicant. The Applicant may request a 1-hour consultation to discuss the results of the material modification review.

If a proposed modification is determined by DTE to be a Material Modification, it must be reviewed by DTE to determine if changes are acceptable without further or additional study. Each potential Material Modification must be reviewed by DTE on a case-by-case basis. A non-exhaustive list of example Material Modifications that may or may not require additional study are listed below.

Material Modifications that would be acceptable and typically would not require re-study:

- Small Transformer Changes (base rating remains unchanged)
  - o Minor Impedance change (evaluated on a case by case basis, dependent on connection type and/or previous study results)
  - o X/R Ratio change only
- Changes to collector system cable lengths (conductor type/size remains unchanged)
  - o Small change in lengths (evaluated on a case by case basis, dependent on connection type and/or previous study results)
- Small relocation of the point of interconnection (evaluated on a case by case basis)

Material Modifications that would typically require re-study to determine acceptability:

- Inverter Changes (other than above) that are not for the same model and configuration due to failure
- Inverter changes or upgrades to add functionality or connections.
- Addition of energy storage
- Collector System Re-Design
  - o System Voltage Change
  - o Number of Transformation Levels change
- Transformer base rating or impedance change (other than above)
- Replacement of switchgear or any wiring or switchgear replacement that changes the one line of the customer site between the generator and the PCC.
- Collector system cable changes (other than above)
- Relocation of the point of interconnection (other than above)

For a proposed modification that DTE has determined is not a material modification, or is a material modification, but does not require further study, DTE shall continue processing the interconnection application according to these procedures.

If the modification was found to be material and further study is required, the applicant shall notify DTE through PowerClerk within 10 business days of receiving the results of the material modification review with their choice of: Entering into a study agreement, withdrawing the proposed material modification; withdrawing the interconnection application; or withdrawing the proposed material modification and proposing a different material modification to start a new material modification review. If DTE does not receive a response in PowerClerk within 10 business days of the applicant receiving the notification of the results of the Material Modification review, the modification may be considered withdrawn.

If a Project must be restudied as a result of a Material Modification, the study will follow either the Supplemental Review, or Study Track process, depending on the current track of the project and the type, scale and complexity of the proposed material modifications. As part of the material modification evaluation results, timelines will be communicated to the Applicant along with any associated study fees and study agreements. Timelines and fees will be specified on a case by case basis and determined based on the scope and scale of the proposed material modifications and the extent of study required, taking into account any prior study results or portions of study that DTE determines do not need to be re-studied.

If a DER is proposing to be modified after the execution of the interconnection agreement, and prior to DTE providing written authorization to operate in parallel, the applicant shall notify DTE through PowerClerk of any plans to modify the DER. DTE shall review the proposed modification to determine if the modification is considered a material modification. If DTE determines that the modification is a material modification, DTE shall notify the applicant in writing and through PowerClerk of its determination and the applicant shall submit a new application and application fee along with all supporting materials that are reasonably requested by DTE. The applicant may not begin any material modification to the DER until an interconnection agreement incorporating the material modification is fully executed. The new application with material modifications is subject to all applicable Interconnection Procedures and terms of a new Interconnection Agreement.

If a DER is proposing a Modification after Authorization to Operate in Parallel and the interconnection application is marked Complete in PowerClerk, and DTE determines that the proposed modification is material,, a new application must be submitted. The new application with material modification is subject to all applicable Interconnection Procedures and terms of a new Interconnection Agreement.

## 2. OPERATIONAL PROVISIONS

If a Contact List (**Appendix G**) is required, the Applicant is required to notify DTE prior to synchronizing to and prior to scheduled disconnection from the electric system.

The Project may not commence parallel operation until approval has been given by DTE. The completed installation is subject to inspection by DTE prior to approval. Preceding this inspection, all contractual agreements, payments, and obligations must be executed by the Applicant.

### 2.1 Disconnection

After interconnection, where DTE Electric finds that there are grounds to believe that a DER is operating outside the terms of the interconnection agreement, and DTE Electric determines that immediate disconnection is not warranted, DTE Electric will upon discovery of the grounds promptly inform the interconnection customer or its agent of this finding and the interconnection customer will be responsible for bringing the DER into compliance within 30 business days or a mutually agreed-upon time period, consistent with R 460.976 Rule 76.

For the avoidance of doubt, the following types of Project non-compliance shall result in prompt disconnection of a Project under R 460.978 Rule 78:

- a. Interconnecting a Project prior to approval from DTE Electric under section 1.12 of these Procedures;
- b. After interconnection and without DTE's prior written approval, changing settings on the power control system for the Project from those specified in the Interconnection Agreement; or
- c. After interconnection and without DTE's prior written approval, adding generation or storage (for example, an additional solar panel or panels) in addition to the generation or storage specified in the Interconnection Agreement.

After disconnection pursuant to (a), (b), or (c), a Project must submit a new Application, pay all accompanying costs, and restart the interconnection process prior to potential future project interconnection and authorization to operate in parallel with the DTE Electric system.

DTE may refuse to connect, or may disconnect, or revoke the Parallel Operating Authorization a project from the electric system if any of the following conditions apply:

- a. Lack of written authorization from DTE to interconnect or fully executed Generator Interconnection and Operating Agreement
- b. Termination of interconnection by mutual agreement
- c. Noncompliance with technical or contractual requirements in the Generator Interconnection and Operating Agreement, after 30 business days of notification is provided to the Applicant of the technical or contractual deficiency that does not degrade the reliability of the distribution system, electric utility equipment, and electric customers' equipment or presents a safety hazard.
- d. Electric distribution system emergency, but only for the time necessary to resolve the emergency
- e. Routine maintenance, repairs, and modifications are required and performed in a reasonable time with prior notice.
- f. Other material noncompliance with technical or contractual requirements in the

## Generator Interconnection and Operating Agreement.

DTE Electric may require disconnection of a Project from the distribution system for the above conditions, which may include but is not limited to the following examples:

- a. When public safety is being jeopardized.
- b. During voltage, frequency, or loading problems.
- c. When abnormal sectionalizing or circuit configuration occurs on the DTE system.
- d. During scheduled shutdown of DTE equipment that are necessary to facilitate maintenance or repairs. In the event there is demonstrated electrical interference (i.e. Voltage Flicker, Harmonic Distortion, etc.) to DTE customers, suspected to be caused by the Project, and such interference exceeds then current system standards, DTE reserves the right to install special test equipment as may be required to perform a disturbance analysis and monitor the operation and control of the Project to evaluate the quality of power produced by the Project. In the event that no standards exist, then the applicable tariffs and rules governing electric service shall apply. If the Project is the source of the interference, and that interference exceeds DTE standards or generally accepted industry standards, then it shall be the responsibility of the Applicant to eliminate the interference problem.
- e. When either the Project or its associated synchronizing and protective equipment fails or is demonstrated by DTE to be improperly maintained, so as to present a hazard to the DTE system or its customers.
- f. Whenever the Project is operating isolated (islanded) with other DTE customers, for whatever reason.
- g. Export of energy by a non-export project until non export functionality can be suitably demonstrated. DTE will not provide payment for any energy exported to the electrical system by a non-Export project.

DTE may disconnect electric service in order to disconnect a Project from the electric system, pursuant to R 460.136.

### **2.2 Maintenance and Testing**

DTE reserves the right to test the relaying and control equipment that involves protection of the DTE electric system whenever DTE determines a reasonable need for such testing exists.

The Applicant is solely responsible for conducting and documenting periodic maintenance and testing on the generating equipment and its associated control, protective equipment, interrupting devices, and main isolation device, per manufacturer recommendations. DTE reserves the right to review the documentation of periodic maintenance and/or power quality information that the applicant has collected.

If protective relaying is required per the technical requirements, the Applicant is responsible for conducting and documenting periodic maintenance and testing every 4 years on relays and the associated interrupting devices, control schemes, and batteries, unless a written extension is provided by DTE. If testing is required, it shall be conducted in accordance with the test procedures provided by DTE as part of inspection testing. DTE reserves the right to review the protection settings at any time and provide changes to those settings as needed.

DTE reserves the right to witness the testing. The Applicant is responsible for maintaining written reports for the above tests for a period of four years. These written reports shall be made available to DTE upon request.

### **2.3 Insurance**

For level 3, 4, and 5 projects, the Applicant shall obtain and continuously maintain, as required in the applicable interconnection agreement, General Liability insurance written on a standard occurrence form, or other form acceptable to DTE, and covering bodily injury and property damage liability with a per occurrence and annual policy aggregate amount of at least:

Interconnection Level Minimum Limit

• Interconnection Level	Minimum Limit
Level 3	\$1,000,000
Level 4	\$2,000,000
Level 5	\$5,000,000

An Example Certificate of Liability Insurance is provided in **Appendix L**

### 3. INTERCONNECTION PROCEDURES TECHNICAL REQUIREMENTS

The following discussion details the technical requirements for interconnection of Level 3,4,5 Projects. Many of these requirements will vary based on the AC nameplate DER capacity and Export Capacity of the Project, generation type, voltage level, and mode of operation (Export or Non-Export). A few of the requirements will vary based on location of the interconnection (isolated load and available fault current).

Certain major components, as specified in this document, must be met to provide compatibility between the Project equipment and the DTE electric system, and to ensure that the safety and reliability of the electric system is not degraded by the interconnection.

DTE reserves the right to evaluate and apply newly developed protection and/or operation schemes at its discretion. All protective schemes and functions are evaluated for compliance to IEEE 1547-2018. In addition, DTE reserves the right to evaluate Projects on an ongoing basis as system conditions change, such as circuit loading, additional generation placed online, or if required to do so by the regional Transmission operator, reliability coordinator or Independent System Operator etc.

#### 3.1 Applicability of IEEE 2800:

The Company currently owns equipment at the following voltages that may require the application of certain IEEE 2800 clauses for inverter-based resources (IBRs):

- Distribution (4.8 kV, 8.3kV and 13.2kV)
- Subtransmission (24 kV, 34.5kV and 40kV)
- High voltage radial lines (typically 120kV, but includes 100 kV or above)

IEEE 2800 shall be applied to projects connected at the transmission level. For Sub-transmission connected projects, IEEE 2800 shall apply with the exception of 4.1 and 4.2 with references to Transmission System Operator (TSO) being replaced with Electric Distribution Company (EDC).

Following the System Impact Study, for projects connected to the distribution system that are determined to have an impact on the transmission system, subtransmission system, or high voltage radial lines, the following subset of the IEEE 2800 clauses shall be applied: 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 4.9, 4.10, 4.12, 10, with references to Transmission System Operator (TSO) being replaced with Electric Distribution Company (EDC).

IEEE 2800 Clause 10 includes requirements for verified IBR plant-level models, documentation detailing development process and verification of these models, and documentation with brief explanation of control strategy. This information shall be provided as part of the Interconnection Application prior to study, or when DTE has determined that a proposed modification is a material modification. After interconnection and/or upon request from the utility, the applicant shall provide within 90 days either updated models or verification that there has been no change to previously submitted models.

For distribution-connected projects applicable IEEE 2800 requirements may be satisfied as follows: For projects utilizing a single inverter, the inverter shall be certified as defined in the procedures and implement settings as provided by DTE, and such certification shall be considered sufficient for meeting the applicable IEEE 2800 clauses. If multiple inverters are configured as a plant, the individual inverters shall be certified as defined in the procedures and implement settings as provided by DTE, and the overall plant shall meet the applicable IEEE 2800 clauses.

### 3.2 Major Component Design Requirements

The data requested for all major equipment and relaying proposed by the Applicant, must be submitted as part of the initial interconnection application for review and approval by DTE. DTE may request additional data be submitted during the interconnection process to clarify the operation of the Project facilities.

Once installed, the interconnection equipment must be reviewed and approved by DTE prior to being connected to the DTE electric system, and before parallel operation is allowed.

Level 3, 4 & 5 project DER must be connected three-phase.

### 3.3 Data

The data that DTE requires to evaluate the proposed interconnection is documented on the generator interconnection application (**Appendix D**). A site plan and one- line diagram with details of the interconnection protection system, are required as part of the application data. For Level 3 projects, the one-line diagram must be sealed by a professional engineer licensed in the state of Michigan or signed by an electrical contractor licensed in Michigan with the electrical contractor's license number noted on the diagram. For Level 4 and 5 projects, the one-line diagram must be sealed by a professional engineer licensed in the state of Michigan.. Three line diagrams and protection configurations may be required depending on the DER connection type and location of the Applicant facility. The generator manufacturer data package should also be supplied including any supplemental equipment datasheets necessary to characterize the DER.

DTE may require the applicant to provide modelling information of the DER to comply with MISO reliability and system modeling requirements.

The Applicant may request DTE study the Project at a reduced power output (Export Capacity) below the AC nameplate DER Capacity. The Applicant must provide the export capacity and method used to reduce the power output as part of the application data for review and approval by DTE.

### 3.4 Isolating Transformers

If a transformer is utilized, the transformer shall meet the following requirements.

- The transformer shall comply with the current ANSI Standard C57.12.
- The transformer shall have voltage taps on the high and/or low voltage windings sufficient to assure satisfactory generator operation over the range of voltage variation expected on the DTE electric system.
- The proper selection and specification of transformer impedance is important relative to enabling the proposed Project to meet DTE's reactive power requirements (see "Reactive Power Capability and Voltage Control").
- The transformer utility and Project side winding connections shall be selected using the following table. The transformer may have multiple project side windings.

PCC	System	Transformer Winding Connection	
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Voltage	Configuration	Utility Side	Project Side	Special Requirements
40 kV	Grounded Wye	Delta	No Preference	
		Grounded Wye	Delta	See Note 1
Below 40 kV	Grounded Wye	Grounded Wye	Ungrounded Wye	See Note 2
			Grounded Wye	See Note 3
	Delta	Delta	No Preference	

Table – Three Phase Transformer Winding Connections

Note 1: Requires the Project to be connected to its own line exit.

Note 2: Additional transformers connected to the Project side transformer winding cannot in combination with each other be a source of zero sequence current. For example, an ungrounded wye to delta transformer with the neutrals of both ungrounded wye transformer windings connected. The connection of the neutrals would cause the series combination of the grounded wye to ungrounded wye transformer and the ungrounded wye to delta transformer to mimic a grounded wye to delta transformer which is a source of zero sequence current.

Note 3: Additional transformers connected to the Project side transformer winding cannot be a source of zero sequence current. For example, the transformer may not be connected Grounded Wye (utility side) – Delta (Project side).

### 3.5 Interrupting Device

A three-phase interrupting device is required between the Project and DTE, where applicable as determined by DTE.. The interrupting device may be required to be located at the PCC depending on protective and operational requirements of the area. If required, the interrupting device shall meet the following requirements.

- Must be a recloser, circuit switcher, or breaker.
- Must be approved for use on the DTE electric system.
- Must comply with current relevant ANSI and/or IEEE Standards.
- Must be rated for the application.
- Must have adequate interrupting capability. DTE will provide maximum short circuit currents and X/R ratios for faults at the PCC upon request.

### 3.6 Isolation Device

A main isolation device, that is readily accessible, lockable and provides a visible break shall be located between DTE and the project DER when required by DTE operating procedures as determined by the operating voltage of the site.

An isolation device is required and should be placed at the PCC. It can be a pole top switch, load-break disconnect, etc., depending on the electrical system configuration. The isolation device shall meet the following requirements.

- Must be approved for use on the DTE electric system.
- Must comply with current relevant ANSI and/or IEEE Standards.
- Must have load break capability, unless used in series with a three-phase interrupting device. Must be rated for the application.
- Must be operable and accessible by DTE at all times (24 hours a day, 7 days a week). If the device is remotely operable, DTE shall have remote access to the device at all times.
- The isolation device will be used as a protective tagging point. The device must have visible open break provisions for padlocking in the open position, and it must be gang operated. If the device has automatic operation, the controls must be located remote from the device.
- The installation of the device shall meet OSHA, NEC, and NESC requirements for access and arc flash.
- Must be clearly marked to include signage per the National Electrical Code (NEC), as applicable.

### **3.7 Interconnection Facilities**

The available system voltage, as well as equipment and operational constraints influence the chosen point of interconnection. DTE has the ultimate authority to determine the acceptability of a particular PCC.

Any new line or interconnection facilities required to connect the Project to the DTE's electric system will be constructed by DTE at the Applicant's expense. DTE may require one or more utility owned and controlled devices and supporting structures to allow for communication and control and proper operation of the electrical system. These will be included in the interconnection facilities.

DTE may require the new line construction to be terminated on a structure provided by the Applicant. Interconnection lines and facilities must be coordinated with DTE.

The applicant is responsible for securing any new Rights of Way for the project interconnection facilities or line extensions.

### **3.8 Termination Structure**

The Applicant is responsible for ensuring that structural material strengths are adequate for all requirements. Upon written request, DTE will provide maximum dead-end line tension information. The structure shall adhere to the latest edition of the National Electrical Safety Code (NESC) as adopted by the commission and in accordance with DTE design standards.

Electrical clearances shall adhere to the latest edition of the NESC as adopted by the commission and according to DTE design standards and shall be coordinated with DTE.

The installation of disconnect switches, bus support insulators, and other equipment shall comply with accepted industry practices.

Surge arresters shall be selected to coordinate with the BIL rating of major equipment and rated for the application.

### **3.9 Inverters**

Certified inverter Projects must use inverter(s) that conform to the IEEE 1547.1-2020 standard. In order to show compliance, a certificate of compliance from an OSHA approved national recognized testing laboratory must be submitted as part of the application and the manufacturer must mark the equipment such that a field inspection can verify the certification. The certification of compliance must clearly state the inverter has been tested to the latest UL 1741 using IEEE 1547.1-2020 as the functional Source Requirement Document.

The inverters shall be certified to meet the following performance Categories.

1. Normal Operating Performance – Category B

Abnormal Operating Performance – Category III \*\* The manufacturer is required to mark the abnormal operating category on the equipment.

If the requirements of this section are met, the inverter is deemed “certified” as defined within **Appendix C**.

Documentation of harmonics testing of the inverter to IEEE-519 standards and supporting harmonics tables shall be submitted to DTE, where applicable as determined by DTE.

### **3.10 Interconnection Protection**

The interconnection relaying design requirements are intended to assure adequate protection of the DTE electric system. Any additional relaying which may be necessary to protect equipment at the Project is solely the responsibility of the Applicant to determine, design, and apply.

The relaying requirements will vary with the DER capacity rating of the Project, the type of generation being used, configuration of the Project, and the mode of operation (Export or Non-Export).

All relaying proposed by the Applicant to satisfy these requirements must be submitted for review and approved by DTE. DTE may request test records and verification of settings operation at any time.

### **3.11 Protective Relaying General Considerations**

The installation of utility grade relays are required for all Project types, where applicable as determined by DTE. All relays must be equipped with targets or other visible indicators to indicate that the relay has operated.

If the protective system uses AC power as the control voltage, it must be designed to disconnect the generation from the DTE electric system if the AC control power is lost. DTE will work with the Applicant regarding the system design for this requirement.

The protective system must be designed such that the Applicant is prevented from energizing the DTE electric system if that system is de-energized.

DTE may require a breaker failure detection scheme and alarming or other failsafe systems to identify and mitigate mis-operation of the protection system.

### **3.12 Capacity of the DER and Acceptable methods for power limiting or export control**

DTE shall study interconnection of limited-export or non-exporting generating facilities and energy storage and allow those that meet the requirements in this section and R 460.980(4). The applicant must submit an interconnection application based on the total aggregate AC nameplate capacity (DER Capacity) of the site that will be defined as the maximum capacity and supply the maximum deliverable fault current of the DER(s). An export capacity may be supplied in the application for consideration by DTE; however, all determinations of project level and application of interconnection process will be made with reference to the DER Capacity unless otherwise specified. The DER Capacity used to review an interconnection application for an inverter-based resource will be the lesser of the nameplate capacity of generation and storage equipment or the nameplate capacity of the inverter(s). DTE will perform studies and screens based on the relaying or power control method being utilized and assess the risk of the export capacity method vs the DER capacity. Additionally, some screens and studies will apply other electrical and operating parameters of the DER. For example, screens and studies that evaluate protection fault current shall use full instantaneous fault rating of the device as fault current is not controlled through power limiting functions, only steady state power output. Similarly screens and studies may use the total power output in Apparent power (MVA) when considering the impacts of voltage control modes that may reduce the real power output.

If a DER uses any configuration or operating mode to limit the export of electrical power across the Point of Common Coupling, then the export limited capacity shall be only the amount capable of being exported. To prevent impacts on system safety and reliability, DTE will assess the risk of the proposed method based on the DER Capacity against the proposed export capacity and the method proposed by the applicant as described in the screening process in **Appendix H**. The export capacity, if accepted, will be documented independently from the DER AC nameplate rating in the Interconnection as a condition of the Interconnection Agreement and Parallel Operation Authorization.

An Applicant is required to provide the export capacity in the application, which is either the DER Capacity or a lower amount defined below when using one of the following methods.

See **Appendix H** for additional initial fast track and study screening criteria and requirements for export-limited systems.

If the period of continuous inadvertent export from a certified, PCS or inverter exceeds 30 seconds, the DER shall disconnect from the distribution system, cease to energize the distribution system, or halt energy production within 2 seconds, and then follow return to service criteria. Inadvertent export outside of these ranges including repetitive or frequent inadvertent export shall be subject to disconnection until the equipment can be repaired and brought back into compliance through verifiable testing.

The following methods may be accepted:

1. 32R Relay Reverse power

This relay will be applied to non-export projects. The reverse power relay must be selected such that it can detect a power flow in the DTE system of a small fraction of the overall Project DER capacity. The relay will trip a dedicated generation breaker, the generation prime mover, or a breaker identified by the applicant that can verifiably isolate the generation within the required timing. The relay will normally be set near its minimum (most sensitive) setting and will take into account the total metering accuracy of the protection system. By default, it will trip after a 1 second time delay. The delay will avoid unnecessary tripping for momentary conditions. More specific settings will be issued on a case-by-case basis and be documented in the Interconnection Agreement.

## 2. 32R Relay Reverse power - Power limiting

This relay will be applied to limited export projects. The reverse power relay must be selected such that it can detect a power flow into the DTE system above the Project export capacity. The relay will trip a dedicated generation breaker, the generation prime mover, or a breaker identified by the applicant that can verifiably isolate the generation within the required timing. The relay will normally be set to have 102% of the export capacity and will take into account the total metering accuracy of the protection system. By default, it will trip after a 2 second time delay. The delay will avoid unnecessary tripping for momentary conditions. More specific settings will be issued on a case-by-case basis and be documented in the Interconnection Agreement.

## 3. 32U Relay – Under Power (Minimum Import)

This relay will be applied to limited export projects. The Under-power relay must be selected such that it can detect a minimum amount of power flow from the DTE system. The relay will trip a dedicated generation breaker, the generation prime mover, or a breaker identified by the applicant that can verifiably isolate the generation within the required timing. The relay will normally be set near its minimum (most sensitive) setting and will take into account the total metering accuracy of the protection system. By default it will trip after a 2 second time delay. The delay will avoid unnecessary tripping for momentary conditions. More specific settings will be issued on a case by case basis and be documented in the Interconnection Agreement. Special consideration should be taken when selecting and setting and under-power function due to minimum operating quantities required for the function to operate correctly.

4. The nameplate rating of the DER, minus any auxiliary load, must be so small in comparison to its host facility's minimum load that the use of additional protective functions are not required to ensure that power is not exported to the distribution system. This option requires the DER capacity must be no greater than 10% of the applicant's verifiable minimum gross load over the past 12 months. The customer is responsible for disabling the DER for any times where load will fall below the value specified in the interconnection agreement, such as during a plant shutdown or maintenance activities.
5. A reduced output rating utilizing the power rating configuration setting may be used to ensure the DER does not generate power beyond a certain value lower than the nameplate rating. This adjustment to nameplate rating must show permanent modification of the DER output capability with vendor documentation and equipment labelling indicating the nameplate value has been changed. This nameplate change must be stable through firmware updates and not be user modifiable. An inverter settings compliance report is required upon commissioning and at any time upon request from the utility.
6. DERs may utilize a Nationally Recognized Testing Laboratory Certified Power Control System and inverter system that limits the ability of end users to modify PCS limits, as required by NEC 750.30(C), UL 3141 6.17, or other applicable standard. The Customer is responsible for maintaining the settings provided and verified in the commissioning tests. . An inverter settings compliance report is required upon commissioning and at any time upon request from DTE.

The applicant may propose alternative methods to ensure power is not continuously exported above a mutually agreed upon limit across the point of common coupling. The applicant must provide detailed documentation stating how the alternate method limits export and inadvertent export levels to levels approved by DTE. The applicant must list the export capacity as the mutually agreed upon limit in the application when using an alternative method. Review of the alternative method may result in the application being placed on hold to provide sufficient time to review the proposed method. DTE will evaluate the method to determine if it will meet criteria for safe and reliable operation that are compatible with the electrical system and operating practices.

The following process will be used to evaluate inverter based power control systems.

Power limiting process

1. Applicant applies for a system with an inverter(s) and lists a desired export limited capacity in addition to the DER nameplate and DER capacity. Power limiting is not applicable to discrete microinverters unless they centralize to a concentrator that meets PCS standards and has been certified to operate with the microinverters as a system..
2. Applicant also selects an applicable inverter that implements either a reduced output rating or power limiting function.
3. DTE identifies that the project requires power limited export due to site restrictions, safety concerns, tariff requirements or regulatory compliance. Alternatively, power limited export is chosen as an option by the applicant.
4. Applicant provides one-line or three line diagram indicating equipment with power-limited export and associated measuring, metering and sensing devices.
5. DTE ensures that the selected inverter has power-limited export capability meeting the criteria in the acceptable methods for power limiting and export control.
6. DTE provides applicant the required power-limited export value in kW for each specified inverter.
7. DTE approves the application package and allows the applicant to construct the project and instructs applicant to provide necessary power-limited export documentation. The required documentation is as follows:
  - a. Inverter settings compliance report. This report should include the inverter manufacture, inverter model, inverter unique identification number, a power-limited export value in kW, manufacturer contact information and the address that the inverter will be installed at.
  - b. Photograph of the nameplate or LCD display on each specified inverter showing a unique identification number (such as serial number) that matches the compliance report
  - c. Photograph of Inverter power-limited export value setting in kW as applicable to that inverter model.
8. Applicant obtains required documentation to prove that specific inverters at a given premise are limited to the DTE required limit and provides that documentation to DTE.
9. DTE verifies that all the provided documentation meets all the necessary requirements to implement the power-limited export and keeps a record of the inverter settings and compliance report
10. DTE may ask for validation of the settings at any time, and if settings have changed, the DER is subject to disconnection as a violation of the Interconnection Agreement and Parallel Operating Authorization.

### **3.13 Testing and certification requirements of DER telecommunications, cybersecurity, data exchange, and remote control operation**

Based on the Project system impact, Size, Project design, exiting and proposed grid equipment, operational constraints, design standards, Project operational requirements, risk to critical infrastructure or other customers, compliance to program or tariff or other factors DTE shall undertake a review of necessary telecommunications, settings, configuration, cybersecurity, data exchange and remote control requirements and determine what if any requirements are appropriate for the project to safely and reliably connect to the electrical system These requirements will be detailed in the Construction Agreement attachment to the Interconnection Agreement and are a requirement for interconnection.

DTE may determine in an effort to expedite Project progress, and at its sole discretion, that no additional study or review is needed and provide a set scope of telecommunications, settings, configuration, cybersecurity, data exchange and remote control that is acceptable to the Utility. This may be provided as a standard package prior to any study to allow the Project to understand its responsibilities.

Notwithstanding Project and site specific requirements determined during study or review, the following will be true for all projects and requirements will be detailed in the Construction Agreement attachment to the Interconnection Agreement:

Projects exceeding 1MW and those required by study to SCADA must have utility SCADA monitoring utilizing a DTE specified point list, method of transport and protocols either through a DTE provided device or utilization of customer switchgear or breaker and relaying equipment as agreed to by DTE.

Metering equipment, CTs, PTs and associated telecommunications will be provided and maintained by DTE. It is the customers responsibility to provide meter sockets, CT cabinets, support structures, conduit and wiring in compliance with DTE Service Installation Manual, Primary Services Design and all relevant and effective codes and procedures.

Study may indicate that projects of any size may require additional telecommunications, cybersecurity, data exchange, and remote control.

Projects desiring market access will be subject to designs that are compliant with MISO or other market requirements.

Projects participating in Utility programs or Tariffs may be subject to additional requirements for testing, certification, telecommunications, cybersecurity, data exchange, and remote control as dictated by and in compliance with those programs or Tariffs.

Projects that have BES, NERC or FERC compliance requirements shall be notified of their responsibility and be subject to the current and on-going responsibilities entailed in those requirements as part of the interconnection agreement and the Authorization for Parallel Operation.

Interface between DTE and the project shall conform with DTE design and cybersecurity standards and be in compliance with the current IEEE1547 including the current version of IEEE 1547.3

DTE is not responsible for the Projects telecommunications to the project owner, operator or

other third parties that the Project may be associated with. This would also include communications to and from market entities by the Project.

DTE will specify site specific design requirements, configurations, hardware and network architecture to ensure necessary isolation of metering and grid control networks from the public internet, customer networks and any other networks present at the Project site(s).

### **3.14 Momentary Paralleling**

For situations where the Project will only be operated in parallel with DTE electric system for 100 milliseconds or less, as in a make-before-break automatic transfer scheme, no additional relaying is required. Such momentary paralleling requires a modern integrated Automatic Transfer Switch (ATS) system, which is incapable of paralleling the Project with the DTE electric system. The ATS must be tested and verified for proper operation at least every 4 years unless a written extension is provided by DTE. DTE may be present during this testing. DTE may request test records and verification of operation at any time.

### **3.15 Instrument Transformer Requirements**

All relaying, if utilized, must be connected into instrument transformers. DTE may allow the use of Capacitive Voltage Sensors for select protective functions.

All current connections shall be connected into current transformers (CTs). All CTs shall be rated to provide no more than 5 amperes secondary current for all normal load conditions, and must be designed for relaying use, with an “accuracy class” of at least C50. Current transformers with an accuracy class designation such as T50 are NOT acceptable. For three-phase systems, all three phases must be equipped with CTs.

All potential connections must be connected into voltage transformers (VTs). For single-phase connections, the VTs shall be provided such that the secondary voltage does not exceed 120 volts for normal operations. For three-phase connections, the VTs shall be provided such that the line-to-line voltage does not exceed 208 volts for normal operation, and both the primary and secondary of the VTs shall be connected for grounded-wye connections.

### **3.16 Direct Transfer Trip (DTT) and Supplemental Anti-Islanding**

Direct Transfer Trip may be required as indicated by supplemental anti-islanding screening or during study, to prevent sustained isolated operation of the generation for conditions where voltage and frequency protective relaying at the Project may not otherwise operate. Direct Transfer Trip or supplemental anti-islanding is generally not required for Projects that will operate in the Non- Export Mode since a more economic reverse power relay scheme can usually meet the requirements. For Export Projects, the need for DTT or supplemental anti-islanding is determined based on the location of the PCC and generation type during fast track screening or the System Impact Study protection review.

For synchronous and induction type projects, DTE requires DTT when the total generation within a protective zone is greater than 33% of the minimum Utility load that could be isolated along with the generation. In cases where it can be shown that self-excitation of the induction generator cannot occur when isolated from the DTE system, DTE may waive the requirement.

For Fast Track projects screening for anti-islanding uses of DTT and supplemental anti-islanding will be applied as contained within the initial review screens, which may lead to a supplemental review for risk of islanding. For study track projects and projects on networked systems the requirements for DTT or supplemental anti islanding functions and associated equipment will be determined during the relay protection review in the system impact study.

For projects that fail unintentional island screening, an approved supplemental anti-islanding method shall be used. This prevents sustained isolated operation of the generation for conditions where the inverter anti-islanding may not otherwise trip the Project. Inverter based Projects shall be certified to comply with anti-islanding safety standards in addition to any DTT requirements.

For Fast Track projects screening for anti-islanding uses of DTT will be applied as contained within the initial review screens, which may lead to a supplemental review for risk of islanding. For study track projects the requirements for supplemental anti islanding functions or equipment will be determined during the relay protection review in the system impact study.

Approved methods of supplemental anti islanding include protective relays for the detection of over-/underfrequency or over/undervoltage, reverse power detection, or minimum import/export relays, and direct transfer trip (DTT).

Direct Transfer Trip and supplemental anti-islanding may add to the cost and complexity of an interconnection. The Applicant will be responsible for all expenses associated with the installation, operation, and maintenance of the DTT or supplemental anti-islanding system.

When DTE determines that DTT is required, a DTT transmitter, installed by DTE, is generally required for each Utility protective device whose operation could result in sustained isolated operation of the Project. At least one associated DTT receiver, that is supplied, owned, operated and maintained by DTE, is required at the Project. A data Communication Circuit is generally required at each transmitter and receiver location dependent on the DTT technology. Telemetry is required to monitor status of the DTT communication, even if telemetry would not otherwise have been required.

The Applicant shall provide a suitable location, approved by DTE, for the Applicant to install the DTT receiver and associated equipment. The Applicant shall provide the following connections and associated equipment to the location, which may include but is not limited to:

1. A 24, 48 V or 125 V DC power supply capable of providing an 8-hour backup. The Applicant shall coordinate with DTE to properly size the DC power supply.
2. A 120 V AC power supply for heating unconditioned (e.g. outdoor) locations and for use with AC/DC converters. The Applicant shall coordinate with DTE to properly size the AC power supply.
3. A control circuit or communication cable to allow the DTT receiver to trip and lockout the Project.
4. A control circuit for transferring telemetry and disturbance monitoring statuses (e.g. LOG, RTX) to the Project prior to being passed to the RTU using the Communication Interface.
5. An antenna cable for connection to an external antenna. DTE will supply the antenna cable.

6. A communication cable for connection to Communication Circuit equipment (e.g. Router/Switch).
7. A voice Communication Circuit, when cellular phone service is not available, for the commissioning and checkout of the metering, DTT, and RTU.

The above connections shall be connected to the DTT receiver by the Applicant where indicated by DTE.

### **3.17 Reverse Power Relaying for Non-Export**

If Export Mode is not utilized, reverse power protection must be provided. The reverse power relaying will detect power flow from the Project into the DTE system, and operation of the reverse power relaying will separate the Project from the DTE system.

### **3.18 Automatic Reclosing**

DTE employs automatic multiple-shot reclosing on most of the circuit breakers and circuit reclosers to increase the reliability of service to its customers. Automatic single-phase overhead reclosers are regularly installed on distribution circuits to isolate faulted segments of these circuits.

The Applicant is advised to consider the effects of Automatic Reclosing (both single-phase and three-phase) to assure that the Project's internal equipment will not be damaged. In addition to the risk of damage to the Project, an out-of-phase reclosing operation may also present a hazard to DTE equipment that may not be rated or built to withstand this type of reclosing.

DTE will determine relaying and control equipment (e.g. volt check relays) that needs to be installed to protect its own equipment from out-of-phase reclosing. Installation of this protection will be undertaken by DTE at the expense of the Applicant. DTE shall not be liable to the customer with respect to damage(s) to the Project arising as a result of Automatic Reclosing.

### **3.19 Single-Phase Sectionalizing**

DTE also installs single-phase fuses and/or reclosers on its distribution circuits to increase the reliability of service to its customers. Three-phase generator installations may require replacement of fuses and/or single-phase reclosers with three-phase circuit breakers or circuit reclosers at the Applicant's expense.

### **3.20 Synchronous Projects**

Three-phase or three single-phase over/under frequency (81O/U) relaying and under/overvoltage (27/59) relaying are required. The 27, 59 and 81O/U relays shall be connected to VTs located at the PCC, unless otherwise approved by DTE. VTs connected to the Project side of transformers without zero sequence continuity (e.g. ungrounded wye or delta winding connections) on a grounded distribution system is not allowed.

Transformers 15 MVA (self-cooled rating) or larger shall be equipped with differential (87) relaying thus requiring a three-phase interrupting device on the utility side of the isolation transformer.

Each Project must also be equipped with three-phase voltage-restrained overcurrent (51V) relays to detect faults on the DTE electric system. The (51V) shall be connected to VTs located on the generator branch or bus, unless otherwise approved by DTE. The (51V) relay shall be connected

to CTs that monitor current on the generator branch, unless otherwise approved by DTE.

In order to minimize damage to both Project equipment and to the DTE electric system equipment for loss-of-synchronism (also called out-of-step), and to minimize disruptions to other DTE customers in the area, out-of-step relaying may also be required. The out-of-step relaying would usually be installed at the same location as the metering and would isolate the Project from the DTE electric system.

If the Project is connected to a grounded distribution system via one of the approved isolation transformer connections, ground fault detection for utility faults may be required at the discretion of DTE and will consist of a (59N) ground overvoltage relay or (51N) time overcurrent relay. The specific application of this relay will depend on the connection of the isolation transformer and the available ground fault current:

1. If a delta Utility side/grounded-wye Project side isolation transformer connection is used, a (59N) relay will be connected into the secondary of a set of three-phase VTs, which will be connected grounded-wye primary, with the secondary connected delta with one corner of the delta left open or grounded-wye depending on the relay input requirements. The primary windings of the VTs will be connected to the Utility side of the isolation transformer.
2. If a grounded-wye Utility side/grounded-wye Project side isolation transformer connection is used, a (51N) relay will be connected into either a CT located on the Utility side isolation transformer neutral or three phase CTs located on the Utility side of the isolation transformer depending on the relay input requirements. A (59N) relay will be required, in place of the (51N) relay, if the Project does not provide an adequate quantity of ground fault current as determined by DTE. The (59N) relay will be connected into the secondary of a set of three-phase VTs, which will be connected grounded-wye primary, with the secondary connected delta with one corner of the delta left open or grounded-wye depending on the relay input requirements. The primary windings of the VTs will be connected to the Utility side of the isolation transformer.
3. If a grounded-wye Utility side/delta Project side isolation transformer connection is used, a (51N) relay will be connected into either a CT located on the Utility side isolation transformer neutral connection or three phase CTs located on the Utility side of the isolation transformer depending on the relay input requirements.

In some instances, additional (51N) or (59N) relaying may be required for situations where DTE owns an isolation transformer.

### 3.21 Induction Projects

Three-phase or three single-phase over/under frequency (81O/U) relaying and under/overvoltage (27/59) relaying are required. The 27, 59 and 81O/U relays shall be connected to VTs located at the PCC, unless otherwise approved by DTE. VTs connected to the Project side of transformers without zero sequence continuity (e.g. ungrounded wye or delta winding connections) on a grounded distribution system is not allowed.

If the Project is connected to a grounded distribution system via one of the approved isolation transformer connections specified above, ground fault detection for utility faults may be required at the discretion of DTE, and will consist of a (59N) ground overvoltage relay.

Transformers 15 MVA (self-cooled rating) or larger shall be equipped with differential (87) relaying thus requiring a three-phase interrupting device on the utility side of the isolation transformer.

Communication based protection, like line differential (87L) relaying, is required to detect phase and ground faults on the DTE electric system. In cases where it can be shown that self-excitation of the induction generator cannot occur when isolated from the DTE system, DTE may waive this requirement. The relaying shall be connected to CTs and VTS located at the PCC, unless otherwise specified by DTE.

If the Project is connected to a grounded distribution system via one of the approved isolation transformer connections, ground fault detection for utility faults may be required at the discretion of DTE and will consist of a (59N) ground overvoltage relay or (51N) time overcurrent relay. In cases where it can be shown that self-excitation of the induction generator cannot occur when isolated from the DTE system, DTE may waive the requirement. The specific application of this relay will depend on the connection of the isolation transformer and the available ground fault current.

1. If a delta Utility side/grounded-wye Project side isolation transformer connection is used, a (59N) relay will be connected into the secondary of a set of three-phase VTs, which will be connected grounded-wye primary, with the secondary connected delta with one corner of the delta left open or grounded-wye depending on the relay input requirements. The primary windings of the VTs will be connected to the Utility side of the isolation transformer.
2. If a grounded-wye Utility side/grounded-wye Project side isolation transformer connection is used, a (51N) relay will be connected into either a CT located on the Utility side isolation transformer neutral or three phase CTs located on the Utility side of the isolation transformer depending on the relay input requirements. A (59N) relay will be required, in place of the (51N) relay, if the Project does not provide an adequate quantity of ground fault current as determined by DTE. The (59N) relay will be connected into the secondary of a set of three-phase VTs, which will be connected grounded-wye primary, with the secondary connected delta with one corner of the delta left open or grounded-wye depending on the relay input requirements. The primary windings of the VTs will be connected to the Utility side of the isolation transformer.
3. If a grounded-wye Utility side/delta Project side isolation transformer connection is used, a (51N) relay will be connected into either a CT located on the Utility side isolation transformer

neutral connection or three phase CTs located on the Utility side of the isolation transformer depending on the relay input requirements.

In some instances, additional (51N) or (59N) relaying maybe required for situations where DTE owns an isolation transformer.

### **3.22 Inverter Projects**

To expedite processing, Inverters used in projects should appear on the California Energy Commission's list for certified equipment (<https://www.energy.ca.gov/programs-and-topics/programs/solar-equipment-lists>). Use of an inverter that is not on the CEC list requires the submission in the application of the appropriate UL1741 certification document for the current active supplement version that matches the exact model being utilized and additional supporting information to accurately represent the inverter in the application. Failure to produce the UL certification or discrepancies in the documentation may result in the application being placed on hold while DTE reviews the provided documentation.

Three-phase or three single-phase over/under frequency (81O/U) relaying and under/overvoltage (27/59) relaying are required. The 27, 59 and 81O/U relays shall be connected to VTs located at the PCC, unless otherwise approved by DTE. VTs connected to the Project side of transformers without zero sequence continuity (e.g., ungrounded wye or delta winding connections) on a grounded distribution system is not allowed.

Transformers 15 MVA (self-cooled rating) or larger shall be equipped with differential (87) relaying thus requiring a three-phase interrupting device on the utility side of the isolation transformer.

If the Project is connected to a grounded distribution system, ground fault detection for utility faults is required and will consist of a (59N) ground overvoltage relay. The (59N) relay will be connected into the secondary of a set of three-phase VTs, which will be connected grounded-wye primary, with the secondary connected delta with one corner of the delta left open or grounded-wye depending on the relay input requirements. The 59N relay shall be connected to VTs located at the PCC, unless otherwise approved by DTE. VTs connected to the Project side of transformers without zero sequence continuity (e.g. ungrounded wye or delta winding connections) is not allowed.

In some instances, additional (59N) relaying may be required for situations where DTE owns an isolation transformer.

## 3.23 Interconnection Protection Settings

### 3.23.1 Relay Setting Criteria

The relay settings as detailed in this section will apply in the vast majority of applications. DTE will issue relay settings for each individual Project that will address the settings for these protective functions. All voltages will be adjusted for the specific VT ratio, and all currents will be adjusted for the specific CT ratio. The trip times and thresholds of the over/under voltage and frequency relays may vary depending on Ride Through requirements.

#### *Undervoltage Relays*

Two steps of undervoltage relaying are required when Ride Through is enabled. For the first overvoltage set point, the undervoltage relays will normally be set to trip at 88% of the nominal primary voltage at the relay location, and must reset from a trip condition if the voltage increases to 90% of the nominal primary voltage at the relay location. In order to accommodate variations in this criterion, the trip point of the relays shall be adjustable over a range of 70% of the nominal voltage to 90% of the nominal voltage. The trip time shall not exceed 1.0 seconds at 90% of the relay setting. When Ride Through is enabled, the trip time shall be 5.0 seconds at 90% of the relay setting.

For the second undervoltage set point, the undervoltage relays will normally be set to trip at 70% of the nominal primary voltage at the relay location and must reset from a trip condition if the voltage increases to 72% of the nominal primary voltage at the relay location. In order to accommodate variations in this criterion, the trip point of the relays shall be adjustable over a range of 50% of the nominal voltage to 90% of the nominal voltage. The trip time shall be 1.0 second at 90% of the relay setting.

#### *Overvoltage Relays*

Two steps of overvoltage relaying are required. For the first overvoltage set point, the overvoltage relays will normally be set to trip at 110% of the nominal primary voltage at the relay location, and must reset from a trip condition if the voltage decreases to 108% of the nominal primary voltage at the relay location. In order to accommodate variations in this criterion, the trip point of the relays shall be adjustable over a range of 105% of the nominal voltage to 120% of the nominal voltage. The trip time shall not exceed 1.0 seconds at 110% of the relay setting.

For the second overvoltage set point, the overvoltage relays will normally be set to trip at 120% of the nominal primary voltage at the relay location, and must reset from a trip condition if the voltage decreases to 118% of the nominal primary voltage at the relay location. In order to accommodate variations in this criterion, the trip point of the relays shall be adjustable over a range of 115% of the nominal voltage to 140% of the nominal voltage. The trip time shall be instantaneous (relay operating time not to exceed 0.02 seconds at 110% of the trip setting).

#### *Underfrequency Relays*

Two steps of underfrequency relaying are required when Ride Through is enabled. For the first underfrequency setpoint, the underfrequency relay will normally be set for a trip point of 58.5 Hz and must trip instantaneously within 0.2 seconds. When Ride Through is enabled, the trip time shall be 300 seconds unless otherwise specified. Relays with an inverse time characteristic (where the trip time changes

with respect to the applied frequency) are not acceptable. These relays must respond reliably for applied source voltages as low as 70% of the nominal voltage.

For the second underfrequency set point, the underfrequency relays will normally be set for a trip point of 57.0 Hz and must trip instantaneously within 0.2 seconds. Relays with an inverse time characteristic (where the trip time changes with respect to the applied frequency) are not acceptable. These relays must respond reliably for applied source voltages as low as 70% of the nominal voltage.

### *Overfrequency Relays*

Two steps of overfrequency relaying are required when Ride Through is enabled. For the first overfrequency set point, the overfrequency relay will normally be set for a trip point of 60.5 Hz, and must trip instantaneously within 0.2 seconds. When Ride Through is enabled, the trip time shall be 300 seconds unless otherwise specified. Relays with an inverse time characteristic are not acceptable. These relays must respond reliably for applied source voltages as low as 70% of the nominal voltage.

For the second overfrequency set point, the overfrequency relay will normally be set for a trip point of 62.0 Hz and must trip instantaneously within 0.2 seconds. Relays with an inverse time characteristic are not acceptable. These relays must respond reliably for applied source voltages as low as 70% of the nominal voltage.

### *51V Relays – Voltage Restrained Overcurrent Relays*

For synchronous Project applications, the (51V) relays must be set to detect any phase faults that may occur between the Project and the nearest three-phase fault clearing device on the DTE system. Since these faults may take up to 1-second to detect and isolate, the appropriate saturated direct-axis reactance of the Project will be used depending on its time constants. The CT ratios and specific relay settings will be determined via a fault study performed by DTE. The settings of this device will consider the relay manufacturer's recommended practice for the type of Project and prime mover (mechanical energy source) and will be determined by DTE for the specific system application.

### *59N Relay – Ground Fault Detection*

This relay will be applied to detect ground faults on the DTE system when the Project is connected to a grounded Utility system and not capable of providing an adequate quantity of ground fault current for a 51N relay. This relay will be set for a 10% shift (10 multiples of pickup) in the apparent power system neutral. For an ungrounded-wye transformer winding with a single 120 V secondary VT, the setting will usually be 12 Volts. For a delta transformer winding with broken delta 120 V secondary VTs, the setting will usually be 20 Volts. The time delay will normally be 1 second.

### *51N Relay – Ground Fault Detection*

This relay will be applied to detect ground faults on the DTE system when the Project is connected to a grounded Utility system and capable of providing an adequate quantity of ground fault current. This relay will be set to detect faults on the directly connected Utility system, and the timing will be set to comply with Utility practice for overcurrent relay

coordination. The CT ratio and specific relay setting will be determined via a fault study performed by DTE.

### *32 Relay – Reverse Power*

This relay will be applied to Non-Export projects. The reverse power relay must be selected such that it can detect a power flow into the DTE system. The relay will normally be set near its minimum (most sensitive) setting and will trip after a 1 second time delay. The delay will avoid unnecessary tripping for momentary conditions.

This relay will be applied to limited export projects. The reverse power relay must be selected such that it can detect a power flow into the DTE system above the maximum Project export capacity. The relay will normally be set to have 102% of the maximum export Project capacity and will trip after a 5 second time delay. The delay will avoid unnecessary tripping for momentary conditions.

### *32U Relay – Under Power (Min Import)*

This relay will be applied to limited export projects. The under-power relay must be selected such that it can detect a minimum amount of power flow from the DTE system. The relay will normally be set near its minimum (most sensitive) setting and will trip after a 5 second time delay. The delay will avoid unnecessary tripping for momentary conditions. Special consideration should be taken when selecting and setting an under-power function due to minimum operating quantities required for the function to operate correctly.

## **3.23.2 Inverter Setting Criteria**

DTE will provide inverter settings to the Project Developer. The Project Developer will be responsible for setting the inverters. The settings may include but are not limited to the following:

- Protective Functions – Under/Over Frequency and Voltage Functions
- Voltage and Frequency Ride Through – Operational Ranges and Modes
- Dynamic Voltage Support – Ranges, Behavior (e.g., reactive-current injection)
- Voltage and Frequency Support – SPF, Volt-Var, Watt-War, Volt-Watt, etc.
- Frequency Control – Frequency-droop (Freq-Watt)
- Return to service criteria and ramp rate control
- Power limiting, export or import controls and thresholds

DTE may request changes to settings, that impact the safety and reliability of the distribution electric system. DTE and the Project shall work together to implement any proposed setting changes.

## **3.23.4 Installation Approval**

The Applicant must provide DTE with 10 business days of advanced written notice of when the Project will be ready for inspection, testing and approval.

Prior to final approval for Parallel Operation, DTE specified inverter, control or relay calibration settings shall be applied, and a commissioning test must be performed on the

Project relaying and control equipment that involves the protection of the DTE electric system as per the commissioning attachment of the interconnection agreement. The commissioning test must be witnessed by DTE and can be performed by DTE at the Applicant's request. Within 5 business days from receipt of the completed commissioning test report, DTE will notify the Applicant of its approval or disapproval of the interconnection. If DTE does not approve the interconnection, DTE will notify the Applicant of the necessary corrective actions required for approval. The Applicant, after taking corrective action, may request DTE to reconsider the interconnection request.

In the event that revisions are necessary to the Applicant's submitted design and the Applicant submits revised design drawings to DTE, DTE shall either approve, in writing, the Applicant's revised design drawings as resubmitted, or return them to the Applicant with a clear statement as to why they were not approved. Where appropriate, DTE will indicate required changes on the engineering drawings.

In the event the Applicant proposes a revision to DTE's approved relaying and control equipment used to protect the DTE electric system and submits a description and engineering design drawings of the proposed changes, DTE shall either approve the Applicant's amended design drawings or return them to the Applicant with a clear statement as to why they were not approved. Where appropriate, DTE will indicate required changes on the engineering drawings.

### **3.25.1 Telemetry, Disturbance and Power Quality Monitoring Requirements**

Telemetry, disturbance and power quality monitoring is required in all cases for Projects with aggregate nameplate of greater than 1MW or, when indicated by study, or when DTT is required. For Projects that will operate in the Non- Export Mode, the requirement for telemetry, disturbance, and power quality monitoring will be determined on a case-by-case basis as part of the study process.

### **3.25.2 General telemetry requirements**

Telemetry is the collection of operational information from the electric grid. Telemetry can include data such as voltage, amperage, power, and the status of equipment such as circuit breakers and switches. In addition to monitoring the grid, Telemetering equipment also allows to DTE Electric to operate and control the electric grid such as opening and closing circuit breakers or switches. Telemetry is required for DTE Electric to safely and reliably monitor and operate the electric grid.

Interconnection facilities that are rated below 150kWac and are classified as a Level 1 or 2 may not require telemetering. The communications requirement for a Level 1 or 2 facility may only be for revenue metering. Facilities that supply 150kWac or above and are classified as Level 3 or 4 may be required to have a Remote Terminal Unit (RTU). Level 5 projects are required to have an RTU. The RTU aggregates data collected from the interconnection facility and communicates with DTE Electric's Supervisory Control and Data Acquisition (SCADA) system via a telecommunication backhaul network. Where applicable, the interconnection applicant must provide the necessary communication for connections to the DTE Electric RTU and metering equipment.

At the Interconnection applicant's expense, and if applicable, DTE Electric will purchase, configure, install, and commission the RTU. The size and point count of the RTU is determined based on the DER capacity as well as the number of data points to be monitored. DTE Electric will own, operate, maintain, repair, control, alter, replace, and upgrade the RTU. Alternatively DTE may provide an interconnection gateway cabinet with specification included in the construction agreement for the pad, conduit and power supply needs.

An interior location suitable for floor or wall mounting the RTU is required. The location should be

reasonably close to the origin of telemetering signals or data concentrator. A control room or relay house is acceptable as long as the temperature range is within 0C to 70C. The HVAC requirements for fiber optic terminal equipment are more stringent than what is required for RTU equipment. The below outlines required specifications for the RTU:

1. Cable access can be either through the top or bottom of the RTU cabinet or enclosure.
2. Floor space for standard 8-foot tall, 19" free-standing rack.
3. Wall space for a single door enclosure that is 24 inches wide by 16 inches deep by 40 inches high. The wall mount cabinet weighs 60 pounds and is mounted with a 5/16" or 3/8" inch bolt through mounting tabs at each corner.
4. A 120 VAC 15 Amp convenience power source to the RTU cabinet. This source will utilize a dedicated breaker labeled "DTE-RTU". A 4-foot coil is to be left at the RTU location and will be terminated by DTE Electric inside the RTU cabinet.
5. Station DC power 10A @ 48VDC or 5A @ 125VDC (not shared with other equipment) run to the RTU cabinet for RTU power. The circuit breaker shall label "DTE-RTU". If DC power is not available, a 120 VAC circuit may be used as long as this circuit is sourced from an Uninterruptible Power System with a minimum of 8-hour backup.
6. One stranded AWG #8 conductor will be connected to station ground and run to the RTU cabinet by the customer.
7. The customer will run all data signal cables for physical I/O points to the RTU cabinet or to a nearby (6 feet or less) interface cabinet for termination. Data cables must be shielded with shield grounded at RTU end only. Twisted-pair stranded wire between AWG#16 and AWG#22 or twisted-pair solid wire between AWG#18 and AWG#24 may be used. Cables containing 6, 12, 25 and 32 pairs are typical. A 10-foot coil is to be left at the RTU location and will be terminated by DTE Electric inside the RTU cabinet.
8. All analog quantities will be represented by a + / - 1 milliamp or a 4 to 20 milliamp current loop. The current loop may be shared as long as there are no grounds and it is not driven beyond the manufacturers specified limits. Physical status points will be presented by a dry contact available at the interface cabinet. All status points will utilize the Normally Open contacts of the customer provided isolation relay. The RTU will provide the contact wetting voltage.
9. The customer shall provide data communication cables for virtual I/O points directly to the RTU cabinet for termination. Typical data communication cables include standard CAT V (Ethernet) cables, Industrial Ethernet Cable, or Industrial RS-485 Cables such as Belden 3108A or equivalent.
10. Communication between the customer data concentrator and the DTE Electric RTU shall be via appropriate protocol. Other data communication protocols shall be evaluated on a case by case basis.

When required, telemetry, disturbance monitoring, and power quality monitoring will be provided at the Applicant's expense. In addition to other telemetry costs, a one-time charge will be assessed to the Applicant for equipment and software installed at the DTE System Control Center to process the data signals.

### **3.25.3 Telemetry by project Level**

Telemetry enables DTE to operate the electric system safely and reliably under both normal and emergency conditions. DTE measures its internal load plus losses (generation) on a real time basis via an extensive telemetry system. This system sums all energy flowing into the DTE electric system from Projects interconnected to the system and from interconnections with other utilities. During system disturbances when portions of the electrical systems are out of service, it is essential to know if a Project is online or offline to determine the proper action to correct the problem. Time saved during restoration activities translates to fewer outages and outages of shorter duration for the DTE customers.

Facility Rating	DER Capacity	Telemetry Requirements
level 1	<= 20kW	No RTU. Revenue Metering required; generation meter recommended, and generation meter may be required for specific programs. Telemetry may be needed based on study.
level 2	>20kW <= 150kW	No RTU. Revenue Metering required; generation meter recommended, and generation meter may be required for specific programs. Telemetry may be needed based on study.
level 3	>150kW <= 550kW	Revenue Metering required; generation meter strongly recommended, and generation meter may be required for specific programs. Telemetry may be needed based on study.  If RTU is required: <ul style="list-style-type: none"> <li>i. Real and Reactive Power</li> <li>ii. Voltage</li> <li>iii. Relaying Status</li> <li>iv. Breaker Status If DTT is required: <ul style="list-style-type: none"> <li>i. Disturbance Monitoring may be necessary.</li> <li>ii. Loss-of-guard (LOG) alarm</li> <li>iii. Receive-trip relay (RTX)</li> <li>iv. Lockout relay</li> </ul> </li> </ul>
level 4	>550kW <= 1MW	Revenue Metering required; generation meter required. Telemetry may be needed based on study.  If RTU is required: <ul style="list-style-type: none"> <li>i. Real and Reactive Power</li> <li>ii. Voltage</li> <li>iii. Relaying Status</li> <li>iv. Breaker Status If DTT is required: <ul style="list-style-type: none"> <li>v. Disturbance Monitoring may be necessary.</li> <li>vi. Loss-of-guard (LOG) alarm</li> <li>vii. Receive-trip relay (RTX)</li> <li>viii. Lockout relay</li> </ul> </li> </ul>
level 5	>1MW	Revenue Metering required; generation meter required.  RTU is required: <ul style="list-style-type: none"> <li>I. Real and Reactive Power</li> <li>II. Voltage</li> <li>III. Relaying Status</li> <li>IV. Breaker Status If DTT is required: <ul style="list-style-type: none"> <li>ix. Disturbance Monitoring may be necessary.</li> <li>x. Loss-of-guard (LOG) alarm</li> <li>xi. Receive-trip relay (RTX)</li> <li>xii. Lockout relay</li> </ul> </li> </ul>

### 3.25.4 Disturbance Monitoring

Disturbance monitoring allows DTE to evaluate the performance of the overall protective system for all faults on the electric system. It is critical that sufficient monitoring of the protective system is in place to determine its response.

### 3.25.5 Remote Terminal Unit (RTU)

An RTU is required for level 5 projects. An RTU may be required for level 3 and 4 projects following a system impact study, facilities study, or supplemental study. If the study indicates that the project export capacity exceeds 50% of the annual peak feeder load, or DTT or other remote relaying is required, then an RTU is required.

Telemetry and disturbance monitoring require the installation of a Remote Terminal Unit (RTU), that is supplied, owned, operated, and maintained by DTE. A data Communication Circuit is required for DTE to remotely communicate with the RTU. The Applicant shall provide a suitable location, approved by DTE, for the Applicant to install the RTU and associated equipment. The Applicant shall provide the following external connections and associated equipment to the RTU location, which may include but is not limited to:

1. A 24, 48 V or 125 V DC power supply capable of providing an 8-hour backup. The Applicant shall coordinate with DTE to properly size the DC power supply.
2. A 120 V AC power supply for heating unconditioned (e.g., outdoor) locations and for use with AC/DC converters. The Applicant shall coordinate with DTE to properly size the AC power supply.
3. A control circuit or Communication Interface cable for receiving telemetry and disturbance monitoring statuses.
4. A control circuit or Communication Interface cable to allow the RTU to remotely trip the Project, when remote tripping is required by DTE.
5. An antenna cable for connection to an external antenna. DTE will supply the antenna cable.
6. A communication cable for connection to the Communication Circuit equipment (e.g. Router/Switch).
7. A communication cable for receiving telemetry from DTE metering at the PCC.
8. A voice Communication Circuit, when cellular phone service is not available, for the commissioning and checkout of the metering, DTT and RTU.
9. In some cases where wireless connections are not available or are unreliable, a mast for connection to DTE's wireless communications network may be required.

The above connections shall be connected to the RTU by the Applicant where indicated by DTE in the Interconnection Technical Requirements

When telemetry is required, the following telemetry values will be monitored on the RTU, unless otherwise specified by DTE:

1. Real and reactive power flow, voltage, etc. from the DTE metering at the PCC.
2. The status (normal/fail) of protective relay Communication Channels. A status indication of "FAIL" indicates the Communication Channel used for relaying is unable to perform its protective function. For example, the direct transfer trip receiver loss of guard (LOG) auxiliary relay.
3. The status (open/closed) of each main interrupting device, each generating interrupting device, and each tie/transfer device used to change the configuration of the Project.

4. If the Project is composed of multiple inverters, a single logical (OR) status of the individual inverter “On/Off” states, indicating all inverters are offline or any one or more inverters are online, is permissible). An “On” status would be indicated if any individual inverter is online.
5. The status indicating battery failure of the DC uninterruptible power supplies providing power to the DTT and RTU equipment.
6. The status of the DTE relays indicating under voltage of the 120V AC power supplies providing power to the DTT and RTU equipment.

The RTU will be equipped with “sequence of events” recording when disturbance monitoring is required. The Applicant shall provide the following disturbance monitoring statuses, unless otherwise specified, to be monitored on the RTU:

1. The trip status of an instantaneous relay to act as a ground fault detector for faults on the DTE electric system. This relay shall be connected into the same sensing source as the ground fault protective relay required by DTE.
2. The status of each interrupting device, which is initiated by the interconnection relaying schemes required by DTE.
3. The status indicating operation of the over/under voltage (27/59) relays.
4. The status indicating operation of the under/over frequency (81O/U)relays.
5. The status indicating operation of the ground fault detection (59N and/or 51N) relays.
6. The status indicating operation of voltage restrained overcurrent (51V) relays.
7. The status indicating operation of the reverse power (32R) relays.
8. The status of the following relays, associated to each individual Direct Transfer Trip receiver, which may include but is not limited to:
  - i. Loss-of-guard relay (LOG).
  - ii. Receive-trip relay (RTX).
  - iii. Lockout relay.

The statuses indicated in the above telemetry items 2 through 5 and disturbance monitoring items shall be provided by the Applicant using one of the following methods specified by DTE:

1. Wiring individual contacts directly to a terminal block near the RTU, or
2. Using a Communication Interface to exchange data with the RTU, or
3. Other communication provisions, acceptable to DTE, to remotely access the multi-functional device such that the operation of the individual functions may be evaluated separately.

### **3.25.6 Power Quality Monitoring**

Power quality monitoring allows DTE to evaluate the quality of power produced by the Project during events that cause an electrical disturbance to DTE customers. The power quality

monitoring shall be connected to the DTE metering CTs and VTs located at the PCC. A data Communication Circuit is required for remote access to the power quality monitoring equipment. The Applicant shall provide a suitable location, unless otherwise specified by DTE, located within five feet from the PCC metering, for DTE to install the utility owned, operated and maintained power quality monitoring equipment. DTE will connect the CT and VT circuits from the PCC metering to the power quality monitoring equipment.

### **3.26 Miscellaneous Operational Requirements**

Miscellaneous requirements include synchronizing, ramp rates, reclose blocking, remote trip capability, reactive power capability and voltage control, frequency control, standby power, and system stability limitations.

#### **3.26.1 Operating in Parallel**

The Applicant will be solely responsible for the required synchronizing equipment and for properly synchronizing the Project with the DTE electric system. Voltage fluctuation at the PCC during synchronizing shall be limited per IEEE 1547-2018.

The Project must be capable of controlling the output of active power (ramp rates) after synchronization to avoid issues on the DTE system, which includes but is not limited to voltage fluctuations, harmonics, or oscillations. The Project shall, upon request by DTE, modify the active power output characteristics to prevent such issues after synchronization. Inverter based Projects connected to the DTE system shall be certified, to be capable of normal and soft ramp rates.

The Project must be designed to prevent the Project from energizing into a de-energized Utility line. The Project's circuit breaker or contactor must be blocked from closing in on a de-energized circuit.

If the Project has shown an unsatisfactory response to requests to separate the generation from the DTE electric system, DTE reserves the right to disconnect the Project. For Projects where telemetry is required, the Applicant shall provide DTE the capability to remotely disconnect the Project if specified in the construction agreement. To provide this functionality, the Project may be required to provide a Communication Interface as defined within these requirements.

#### **3.26.2 Voltage and Frequency Ride Through**

Voltage and frequency ride through are generally not required for synchronous and induction Projects. Certified inverter based Projects are required to meet ride through requirements by implementing the inverter setting criteria defined within these procedures. Non-certified inverter Projects will be reviewed on a case by case basis depending on the available ride through capability.

For inverter based Projects where telemetry is required, the Applicant shall provide DTE the capability to remotely issue ride through settings, including the ability to read information required to manage ride through settings. To provide the functionality, the Applicant shall provide a Communication Interface as defined within these requirements.

All under/over voltage and under/over frequency protective functions installed by the Applicant or DTE are required to coordinate with ride through requirements.

### 3.26.3 Reactive Power Capability and Voltage Control

The Project shall be designed to be capable of maintaining a continuous rated power output for the Export portion of the Project, at a power factor within the range of 0.9 (inject) to 0.97 (absorb) for synchronous, non-synchronous and induction Projects and 0.9 (inject) to 0.9 (absorb) for inverter based Projects. This power factor range standard shall be dynamic and can be met using, for example, power electronics designed to supply this level of reactive capability (considering any limitations due to voltage level, real power output, etc.).

Projects that interconnect within customer-owned facilities must be designed to maintain the above dynamic power factor range for the Export portion of the power delivery.

The Applicant shall control voltage at the PCC in accordance with instructions (e.g. voltage or reactive power schedule) provided by DTE. Inverter based Projects shall be certified, to be capable of controlling the voltage level at the Export portion of the Project using the control modes specified in the following table. The Applicant may request measurement data from the DTE metering in order to control the voltage at the PCC.

<b>Control Mode</b>
Specified Power Factor (SPF)
Voltage-Reactive Power (Volt-VAr)
Active Power- Reactive Power (Watt-Var)
Constant Reactive Power
Voltage-Active Power (Volt-Watt)

For inverter based Projects where telemetry is required, the Project shall provide DTE the capability to remotely issue instructions for voltage control, including the ability to read information required to operate the Project. To provide the functionality, the Applicant shall provide a Communication Interface as defined within these requirements. For non-inverter based projects, the need will be reviewed on a case-by-case basis.

DTE existing rate schedules, incorporated herein by reference, contain power factor adjustments based on the power factor of the metered load at these facilities.

### 3.26.4 Frequency Control

Inverter based Projects shall be certified, to be capable of controlling frequency using the control mode(s) specified in the following table. Non-Export projects are subject to the requirement.

<b>Control Mode</b>
Frequency-Watt

The control modes shall respond to frequency measurements at the inverter terminals. DTE shall provide and specify the control modes and settings applicable to the inverter based Project.

For inverter based Projects where telemetry is required, the Project shall provide DTE the capability to remotely issue instructions for frequency control, including the ability to read information required to operate the Project. To provide the functionality, the Applicant shall

provide a Communication Interface as defined within these requirements. For non-inverter based projects, the need will be reviewed on a case-by-case basis.

### **3.26.5 Standby Power**

Standby power will be provided under the terms of an approved rate set forth in DTE Standard Rules and Regulations. The Applicant should be aware that to qualify for Standby Rates, a separate meter must be installed at the generator.

### **3.26.6 System Stability and Site Limitations**

Many locations on DTE's electrical grid have a stiffness ratio of 1, this means that electrical coincidence projects may be spread over a larger area of the grid than a grid with a higher stiffness ratio.

The Stiffness Ratio is the combined three-phase short circuit capability of the Project and the utility system divided by the short circuit capability of the Project measured at the PCC. A stability study may be required for Projects with a Stiffness Ratio of less than 40. Five times the generator rated kVA will be used as a proxy for short circuit current contribution for induction generators. For synchronous Projects, with a Stiffness Ratio of less than 40, DTE requires special generator trip schemes or loss of synchronism (out-of-step) relay protection. If the apparent voltage flicker from a loss-of-synchronism condition exceeds 5%, an out-of-step relay will be required. This type of protection is typically applied at the PCC and trips the entire Project off-line, if instability is detected, to protect the DTE electric system and its customers. If the Applicant chooses not to provide for mitigation of unacceptable voltage flicker (above five percent), DTE may disallow the interconnection of the Project or require a new dedicated interconnection at the Applicant's expense.

The Applicant is responsible for evaluating the consequences of unstable generator operation or voltage transients on Project equipment and determining, designing, and applying any relaying which may be necessary to protect that equipment. This type of protection is typically applied on individual generators to protect the Project facilities.

DTE will determine if operation of the Project will create objectionable voltage flicker and/or disturbances to other DTE customers and develop any required mitigation measures at the Applicant's expense.

## **3.27 Revenue Metering Requirements**

DTE will own, operate, and maintain the billing metering equipment at the Applicant's expense.

### **3.27.1 Non-Export Projects**

A DTE bi-directional meter will be installed that only records energy deliveries to the Project. Generation metering will be used for DTE operations purposes.

### **3.27.2 Export Projects**

The billing metering may need to be replaced. A dedicated data Communication Circuit is required to allow remote access to the billing meter by DTE. If telemetry is required, the

billing metering will be connected to the RTU as part of the installation. The Applicant shall provide a suitable location, approved by DTE, for DTE's owned, operated, and maintained billing metering. The Applicant shall provide DTE access to the premises at all times to install, turn on, disconnect, inspect, test, read, repair, or remove the metering equipment. The Applicant may, at its option, have a representative witness this work.

The metering installations shall be constructed in accordance with the practices, which normally apply to the construction of metering installations for commercial, industrial, or other customers with demand recording equipment. At a minimum two meters will be required; one at the PCC, and one at the generator. For Projects with multiple generators, metering of each generator may be required. When practical, multiple generators may be metered at a common point provided the metered quantity represents only the gross generator output.

DTE shall supply to the Applicant all required metering equipment and the standard detailed specifications and requirements relating to the location, construction, and access of the metering installation and will provide consultation pertaining to the meter installation as required. DTE will endeavor to coordinate the delivery of these materials with the Applicant's installation schedule during normal scheduled business hours.

The Applicant shall provide a mounting surface for the meters, recorders, connection cabinets, a housing for the instrument transformers that meets DTE safety standards, a conduit for the conductors between the instrument transformer secondary windings and the meter connection cabinets, and a conduit for the communication links, if required. All of this equipment must meet DTE specifications and requirements as specified in the SIM manual.

The responsibility for the installation of the equipment is shared between DTE and the Applicant, with the Applicant generally installing all of the equipment on its side of the PCC, including instrument transformers, cabinets, conduits, and mounting surfaces. DTE, shall install the meters, recorders, and communication circuits. DTE will endeavor to coordinate the installation of these items with the Applicant's schedule during normal scheduled business hours.

Projects that participate in utility or market programs must additionally meet the metering requirements of those programs including any requirements for real time telemetry without conflict with the DTE revenue and generation metering

Where applicable, separate metering of station power may be required to accurately meter the generation facility load when the Project is off-line.

Additional metering may be required for specific Company programs or for market participation.

### **3.27.3 Participation in FERC jurisdictional programs (e.g. MISO-managed programs and other aggregation programs)**

An Applicant who does not install a generation meter may not be eligible for participation in FERC Jurisdictional programs (e.g. MISO-managed programs or other aggregation programs). Eligibility will be determined by the relevant requirements and is not within DTE Electric's control. Applicants are urged to consider this before determining the configuration of their system. DTE Electric will provide the generation meter if the Applicant determines they want to participate in these programs at a future date.

### 3.28 Communication Requirements

#### 3.28.1 Communication Interface

A Communication Interface allows for the exchange of data between the DTE RTU (or alternate) and the Project interface equipment. The data may include but is not limited to generator monitoring and control points, disturbance monitoring, and telemetry. When required, the Applicant shall provide an interface capable of exchanging data with the DTE RTU over one of the following protocols using the associated transports and physical layers, as defined by DTE on a case-by-case basis. The Project shall provide a single communication cable to a location near the RTU panel or gateway cabinet.

Protocol	Transport	Physical Layer
IEEE Std 2030.5 (SEP2)	TCP/IP	Ethernet
IEEE Std 1815 (DNP3)	TCP/IP	Ethernet
Sunspec Modbus	TCP/IP	Ethernet
	N/A	RS-485

Table - Approved Protocols / Transport / Physical Layer

DTE will provide the necessary interface information (e.g. data mapping) containing the required monitoring and control functionality. The Applicant and DTE shall work together to implement the Communication Interface.

#### 3.28.2 Communication Circuits

Data Communication Circuits allow for the remote exchange of data between DTE and equipment located at the Project. Telemetry, disturbance monitoring, power quality monitoring, DTT, metering and pilot relaying generally require the use of data Communication Circuits. The Applicant is responsible for all costs including but not limited to materials, installation, operating, telecommunication, maintenance, cancellation fees and monthly charges for the data Communication Circuits.

DTE will determine the quantity and type (e.g. cellular, fiber, radio) of the data Communication Circuits required for the application. DTE will determine the requirements for the data communication circuits based on the parameters of the project including the location on the system, proximity to other utility assets and the protection, telemetry and control requirements. DTE will provide one or more options to the Applicant Which may include utility owned circuits or acceptable leased data communication circuits In the cases that the Applicant may be required by DTE to order and acquire the leased data Communication Circuits. DTE will provide information (e.g. costs, availability) regarding leased data Communication Circuits once made available by the telecommunication provider. DTE is not responsible for any delays caused by the telecommunication provider in providing such information or increased interconnection costs.

Data Communication Circuits require the installation of equipment at the Project that is accessible to DTE and the telecommunication provider. The Applicant shall provide a suitable location, approved by DTE, for the Applicant and/or telecommunication provider to install any necessary Communication Circuit equipment and sufficient space for any DTE equipment, risers, antennas, or supporting infrastructure as specified in the construction agreement or design. A review of each installation shall be made to determine the location and space requirements most agreeable to DTE and the Applicant. DTE will provide the utility information

necessary for proper installation of the equipment. The required equipment will vary based on the type of Communication Circuit. For wireless applications, the required equipment may include but is not limited to coaxial cables, conduits, antennas, surge arresters, cabinets, AC and DC power sources and mounting structures. Wired connections may require the Applicant to install equipment that may include but is not limited to backboards, splice boxes, patch panels, wire, fiber, AC and DC power sources, interface converters, cabinets, conduits, raceways and mounting structures. The Applicant and DTE shall work together to install the data Communication Circuit.

DTE personnel require the use of cellular phone service while performing checkout of the metering, DTT, RTU, and relaying. The Applicant must provide an alternative voice communication method, approved by DTE, when cellular phone service is not available. All copper and fiber Communication Circuits must be properly protected as detailed in IEEE Std. 487 and IEEE Std 1590, respectively.

### **3.29 EV interconnection / Vehicle to Grid**

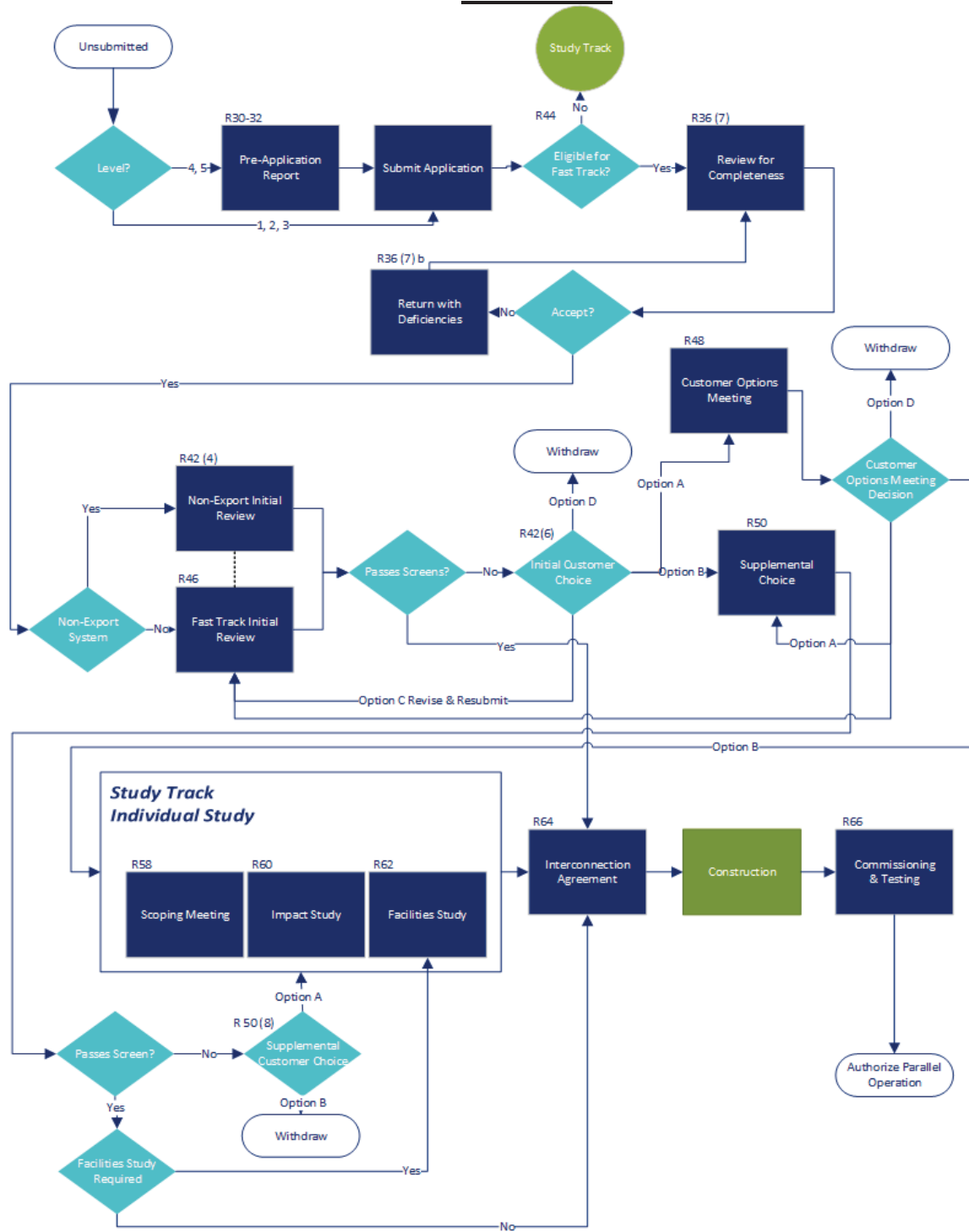
EV systems that are capable of parallel operation with the grid shall require an interconnection and the nameplate of the inverter will be used for purposes of determining the DER Capacity, Export Capacity may be used where applicable if limited by an acceptable means of power limiting as defined in these procedures. EV interconnection shall follow the standard interconnection procedures and requirements.

DTE defines Vehicle to Grid as any EV system capable of paralleling with electrical system even if momentarily. DTE considers Vehicle to Home, if parallel operation is possible, to be indistinguishable from Vehicle to Grid for purposes of requiring an interconnection application. Automatic transfer-trip or similar non-export technology is required to avoid paralleling with the grid.

EV or EVSE Systems that are incapable in any way of operating a source of potential parallel to the grid and use an appropriate isolation means utilizing open transition, shall not require an interconnection and will be considered similar to an isolated backup generator. These systems may be required to provide information on their configuration if they are present with other DER at the site or to qualify for programs.

Back feed from an EV charger operating bi-directionally into a grid outage is strictly prohibited for safety reasons.

# APPENDIX A: INTERCONNECTION PROCESS FLOW DIAGRAM



## **APPENDIX B: COSTS**

### **Interconnection Table – Applicant Costs Levels 3,4,5**

#### **Combined Rider 18 Interconnection Table – Applicant Costs**

	Application
Level 3	\$50

#### **Non-Rider 18, Certified and Non Certified DERs, Interconnection Table – Applicant Costs**

	<b>Pre-Application Review</b>	<b>Application Review</b>	<b>Supplemental Review</b>	<b>System Impact Study</b>	<b>Facilities Study</b>
Non- Export Track (certified)	\$300**	\$100 + \$1/kWac	\$2,500	As necessary*	As necessary*
Non- Export Track (non-certified)	\$300**	\$100 + \$2/kWac	\$5,000	As necessary*	As necessary*
Fast Track (certified)	\$300**	\$100 + \$1/kWac	\$2,500	As necessary*	As necessary*
Fast Track (non-certified)	\$300**	\$100 + \$2/kWac	\$5,000	As necessary*	As necessary*
Study Track Level 3 & 4	\$300**	\$500	N/A	\$5,000***	\$5,000***
Study Track Level 5	\$300**	\$750	N/A	\$15,000	\$15,000

When they are determined to be necessary the following additional study **fees will be clearly indicated on the System Impact study agreement or Facilities study agreement as part of the total fee to be paid for that study phase.**

#### **Interconnection Table – Additional Study Costs by Type**

Reinspection fee	\$100
Telecommunications study	\$1,500
Transient Stability study	\$25,000
Harmonic Interaction study	\$7,000
Electromagnetic study	\$15,000
Sub-Transmission Network study	\$20,000
Transmission Impacts study	\$50,000
MISO Market Coordination study	\$30,000
Transmission Congestion and Losses study	\$40,000
Contingency study (per scenario)	\$5,000
Major Construction Estimating	\$25,000

\* When System Impact Study or Facilities Study are necessary for Non-Export, or Fast Track projects, the studies will follow the respective costs in the Study Track row appropriate to the level of the project.

\*\* pre application required for level 4 and 5

\*\*\* The system impact and facilities study fees for level 3 and 4 may only require the system impact study fee, the applicant will be notified if a facilities study is needed or if that work was completed in the System Impact Study.

## **APPENDIX C: PROCEDURE DEFINITIONS**

**AC:** means alternating current at 60 Hertz.

**Affected system:** means another electric utility's distribution system, a municipal electric utility's distribution system, the transmission system, or transmission system- connected generation which may be affected by the proposed interconnection.

**Alternative electric supplier:** means that term as defined in section 10g of 1939 PA 3, MCL 460.10g.

**Applicant:** means the person or entity submitting an interconnection application, a legacy net metering program application, or a distributed generation program application. An applicant is not required to be an existing customer of an electric utility. An electric utility is considered an applicant when it submits an interconnection application for a DER that is not a temporary DER or a substation backup energy storage device.

**Application:** means an interconnection application, a legacy net metering program application, or a distributed generation program application.

**Area network:** means a location on the distribution system served by multiple transformers interconnected in an electrical network circuit.

**Business day:** means Monday through Friday, starting at 12:00:00 a.m. and ending at 11:59:59 p.m., excluding electric utility holidays and any day where electric service is interrupted for 10% or more of an electric utility's customers.

**Calendar day:** means every day, including Saturdays, Sundays, and holidays.

**Certified:** means an inverter-based system has met acceptable safety and reliability standards by a nationally recognized testing laboratory in conformance with IEEE 1547.1-2020 and the UL 1741 September 28, 2021 edition except that prior to commercial availability, inverter-based systems which conform to the UL 1741SA September 7, 2016 edition are acceptable.

**Commission:** means the Michigan Public Service Commission.

**Commissioning test:** means the test and verification procedure that is performed on a device or combination of devices forming a system to confirm that the device or system, as designed, delivered, and installed, meets the interconnection and interoperability requirements of IEEE 1547-2018 and IEEE 1547.1-2020. A commissioning test must include visual inspections and may include, as applicable, an operability and functional performance test and functional tests to verify interoperability of a combination of devices forming a system.

**Conforming:** means the information in an interconnection application is consistent with the general principles of distribution system operation and DER characteristics.

**Customer:** means a person or entity who receives electric service from an electric utility's distribution system or a person who participates in a legacy net metering or distributed generation program through an alternative electric supplier or electric utility.

**DC:** means "direct current."

**Distributed energy resource:** or “DER” means a source of electric power and its associated facilities that is connected to a distribution system. DER includes both generators and energy storage devices capable of exporting active power to a distribution system.

**DER Capacity:** The aggregate capacity of the site in real power (W) using the nameplate rating in AC. For inverter-based DERs, this shall be based on the nameplate AC rating of the inverter(s) or the nameplate capacity of the generation and storage, whichever is lesser..

**Distributed generation program:** means the distributed generation program approved by the commission and included in an electric utility’s tariff pursuant to section 6a(14) of 1939 PA 3, MCL 460.6a, or established in an alternative electric supplier distributed generation program plan.

**Distribution system:** means the structures, equipment, and facilities owned and operated by an electric utility to deliver electricity to end users, not including transmission and generation facilities that are subject to the jurisdiction of the federal energy regulatory commission.

**Distribution upgrades:** mean the additions, modifications, or improvements to the distribution system necessary to accommodate a DER’s connection to the distribution system.

**Electric utility:** means any person or entity whose rates are regulated by the commission for selling electricity to retail customers in this state.

**Electrically coincident:** means that 2 or more proposed DERs associated with pending interconnection applications have operating characteristics and nameplate capacities which require that distribution upgrades will be necessary if the DERs are installed in electrical proximity with each other on a distribution system.

**Electrically remote:** means a proposed DER is not electrically coincident with a DER that is associated with a pending interconnection application.

**Eligible electric generator:** means a methane digester or renewable energy system with a generation capacity limited to 110% of the customer’s electricity consumption for the previous 12 months.

**Energy storage device:** means a device that captures energy produced at one time, stores that energy for a period of time, and delivers that energy as electricity for use at a future time. For purposes of these rules, an energy storage device may be considered a DER.

**Export capacity:** means the amount of power that can be transferred from the DER to the distribution system. Export capacity is either the nameplate rating or a lower amount if limited using an acceptable means that is defined in an electric utility’s interconnection procedures.

**Facilities study:** means a study to specify and estimate the cost of the equipment, engineering, procurement, and construction work if distribution upgrades or interconnection facilities are required.

**Fast track:** means the procedure used for evaluating a proposed interconnection that makes use of screening processes, as described in R 460.944 to R 460.950.

**Grid network:** means a configuration of a distribution system or an area of a distribution system in which each customer is supplied electric energy at the secondary voltage by more than 1 transformer.

**High voltage distribution:** means those parts of a distribution system that operate within a voltage range specified in the electric utility's interconnection procedures. For purposes of these rules, the term "subtransmission" means the same as high voltage distribution.

**IEEE:** means Institute of Electrical and Electronics Engineers.

**IEEE 1547:** means "IEEE Standard for Interconnection and Interoperability of Distributed Energy Resources with Associated Electric Power Systems Interfaces,"

**IEEE 1547.1** means IEEE "Standard Conformance Test Procedures for Equipment Interconnecting Distributed Energy Resources with Electric Power Systems and Associated Interfaces"

**Inadvertent export:** means unscheduled export of active power from a DER, exceeding a specified magnitude and for a limited duration, due to fluctuations in load- following behavior.

**Inadvertent export susceptible capacity:** means the maximum electric capacity which a DER may introduce to the distribution system during an inadvertent export event, which may differ from either the nameplate or the inverter rating, depending on the configuration. **Initial review:** means the fast track initial review screens described in R 460.946.

**Interconnection:** means the process undertaken by an electric utility to construct the electrical facilities necessary to connect a DER with a distribution system so that parallel operation can occur.

**Interconnection agreement:** means an agreement containing the terms and conditions governing the electrical interconnection between the electric utility and the applicant or interconnection customer. Where construction of interconnection facilities or distribution upgrades are necessary, the agreement, or amendments, shall specify estimated timelines, cost estimates, and payment milestones for construction of facilities and distribution upgrades to interconnect a DER into the distribution system, and shall identify design, controls, settings, procurement, installation, and construction requirements associated with installation of the DER. Standard level 1, 2, and 3 interconnection agreements and level 4 and 5 interconnection agreements are types of interconnection agreements.

**Interconnection coordinator:** means a person or persons designated by the electric utility who shall serve as the point of contact from which general information on the application process and on the affected system or systems can be obtained through informal request by the applicant or interconnection customer.

**Interconnection customer:** means the person or entity, which may include the electric utility, responsible for ensuring a DER is operated and maintained in compliance with all local, state, and federal laws, as well as with all rules, standards, and interconnection procedures. An electric utility is not considered an interconnection customer for temporary DER or a substation backup energy storage device project.

**Interconnection facilities:** mean any equipment required for the sole purpose of connecting a DER with a distribution system.

**Interconnection procedures:** means the requirements that govern project interconnection adopted by each electric utility and approved by the commission.

**Interconnection study agreement:** means an agreement between an applicant and an electric utility for the electric utility to study a proposed DER.

**kW:** means kilowatt.

**kWac:** means the electric power, in kilowatts, associated with the alternating current output of a DER at unity power factor.

**kWh:** means kilowatt-hours.

**Legacy net metering program:** means the true net metering or modified net metering programs in place prior to commission approval of a distributed generation program tariff pursuant to section 6a(14) of 1939 PA 3, MCL 460.6a, and prior to the establishment of an alternative electric supplier distributed generation plan.

**Level 1:** means a certified project of 20 kWac or less.

**Level 2:** means a certified project of greater than 20 kWac and not more than 150 kWac.

**Level 3:** means a project of 150 kWac or less that is not certified, or a project greater than 150 kWac and not more than 550 kWac.

**Level 4:** means a project of greater than 550 kWac and not more than 1 MWac.

**Level 5:** means a project of greater than 1 MWac.

**Level 4 and 5 interconnection agreement:** means an interconnection agreement applicable to level 4 and 5 interconnection applications.

**Limited export:** means the exporting capability of a DER whose export capacity is limited by means specified in an electric utility's interconnection procedures.

**Low voltage distribution:** means those parts of a distribution system that operate with a voltage range specified in the electric utility's interconnection procedures.

**Mainline:** means a conductor that serves as the three-phase backbone of a low voltage distribution circuit.

**Material modification:** means a modification to the DER nameplate rating, DER export capacity, electrical size of components, bill of materials, machine data, equipment configuration, or the interconnection site of the DER at any time after receiving notification by the electric utility of a complete interconnection application. Replacing a component with another component that has near-identical characteristics does not constitute a material modification when agreed to by the electric utility. For the proposed modification to be considered material, it shall have been reviewed and been determined to have or anticipated to have a material impact on 1 or more of the following:

The cost, timing, or design of any equipment located between the point of common coupling and the DER.

The cost, timing, or design of any other application.

The electric utility's distribution system or an affected system.

The safety or reliability of the distribution system.

**Methane digester:** means a renewable energy system that uses animal or agricultural waste for the production of fuel gas that can be burned for the generation of electricity or steam.

**MW:** means megawatt.

**MWac:** means the electric power, in megawatts, associated with the alternating current output of a DER at unity power factor.

**Nameplate rating:** means the sum total of maximum rated power output of all a DER's constituent generating units and energy storage units as identified on the manufacturer nameplate, regardless of whether it is limited by any approved means. Nameplate rating includes all of the following:

- Nominal voltage (V).
- Current (A).
- Maximum active power (kWac).
- Apparent power (kVA).
- Reactive power (kvar).

**Nationally recognized testing laboratory (NRTL):** means any testing laboratory recognized by the accreditation program of the United States Department of Labor Occupational Safety and Health Administration.

**Network protector:** means those devices associated with a secondary network used to automatically disconnect a transformer when reverse power flow occurs.

**Non-export:** An installed electric generation project which operates in parallel with the electric utility with a relay protection scheme and isolating device preventing energy flow back to the utility.

**Non-export track:** means the procedure for evaluating a proposed interconnection that will not inject electric energy into an electric utility's distribution system.

**Parallel operation:** means the operation, for longer than 100 milliseconds, of a DER while connected to the energized distribution system.

**Point of common coupling (PCC):** means the point where the DER connects with the electric utility's distribution system.

**Power Control System (PCS):** means systems or devices that electronically limit or control steady state currents to a programmable limit.

**Project:** Electrical generating equipment and associated facilities that are not owned or operated by an electric utility.

**Radial supply:** means a configuration of a distribution system or an area of a distribution system in which each customer can only be supplied electric energy by 1 substation transformer and distribution line at a time.

**Readily available:** means no creation of data is required, and little or no computation or analysis of data is required.

**Renewable energy system:** Term as defined in section 11(i) of 2008 PA 295, MCL 460.1011(i).

**Secondary network:** means those areas of a distribution system that operate at a secondary voltage level and are networked.

**Site:** means a contiguous site, regardless of the number of meters at that site. A site that would be contiguous but for the presence of a street, road, or highway is considered to be contiguous for the purposes of these rules.

**Spot network:** means a location on the distribution system that uses 2 or more inter-tied transformers to supply an electrical network circuit, such as a network circuit in a large building.

**Standard level 1, 2, and 3 interconnection agreement:** means the statewide interconnection agreement approved by the commission and applicable to levels 1, 2 and 3 interconnection applications. A cover sheet including modifications to address any special operating conditions may be added.

**Study track:** The procedure used for evaluating a proposed interconnection utilizing a system impact study and facilities study “Supplemental review” means the fast track supplemental review screens described in R 460.950.

**Supplemental review:** The fast track supplemental review screens.

**System impact study:** means a study to identify and describe the impacts to the electric utility’s distribution system that would occur if the proposed DER were interconnected exactly as proposed and without any modifications to the electric utility’s distribution system. A system impact study also identifies affected systems.

**Temporary DER:** means a DER that is installed on the distribution system by the electric utility with the intention of not operating at the site permanently.

**UL:** means Underwriters Laboratory.

**UL 1741:** means the September 28, 2021 edition of “Standard for Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources,”

**UL 1741 CRD for PCS:** means the Certification Requirement Decision for Power Control Systems for the standard titled Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources, March 8, 2019.

## **APPENDIX D: INTERCONNECTION APPLICATION**

[INSERT APPLICATION]

**APPENDIX E: SYSTEM IMPACT STUDY AND FACILITIES  
STUDY AGREEMENTS**

[INSERT SYSTEM IMPACT STUDY AND FACILITIES STUDY AGREEMENT]

**APPENDIX F: INTERCONNECTION AND PARALLEL  
OPERATING AGREEMENT**

[INSERT INTERCONNECTION AND PARALLEL OPERATING AGREEMENT]

## **APPENDIX G: CONTACT LIST**

## **APPENDIX H: INITIAL REVIEW SCREENS**

Application Review Screens will be utilized during the application process and are used to inform applicants of an application deficiency or inconsistency or may indicate a critical issue that would prevent compatibility with the DTE Electrical System. These screens include review of the one-line and three-line diagrams for compliance with DTE's SIM and consistency between the site plan, equipment information and application submission materials and a review of the customer information and contact information for accuracy.

Design and Safety Screens will be utilized throughout the process if conditions are noted that will introduce safety or design incompatibilities or if other process such as method of service are required before the interconnection can continue.

Additional screens for specific program participation will be contained in program specific procedures.

The initial review screens are all of the following:

- i. The entire proposed DER, including all aggregated site generation and point or points of interconnection, must be located within the electric utility's service territory.
- ii. For interconnection of a proposed DER to a radial distribution circuit, the aggregated export capacity, including the proposed DER, on the circuit may not exceed 15% of the line section annual peak load as most recently measured or calculated if measured data is not available. A line section is that portion DTE's distribution system connected to a customer bounded by automatic sectionalizing devices or the end of the distribution line. The electric utility shall consider 100% of applicable loading, if available, instead of 15% of line section peak load for level 1 and 2 DER. This screen does not apply to level 1 non-export and level 2 non-export DER applications".
- iii. For interconnection of a proposed DER to the load side of network protectors, the proposed DER must utilize an inverter-based equipment package and, together with the aggregated other inverter-based DERs, may not exceed the smaller of 5% of a network's maximum load or 50 kWac. The DER must not provide reverse power flow into the network protector under any conditions.
- iv. The proposed DER, in aggregation with other DERs on the distribution circuit, may not contribute more than 10% to the distribution circuit's maximum fault current at the point on the primary voltage nearest the proposed point of common coupling, based on nameplate rating. This screen does not apply to level 1 applications, except in situations where the addition of the DER would render the protection scheme inoperable and to be modified to be able to continue to operate as designed.
- v. The proposed DER, in aggregate with other DERs on the distribution circuit, may not cause any distribution protective devices and equipment or interconnection customer equipment on the system to exceed 87.5% of the short circuit interrupting capability, based on nameplate rating. An interconnection may not be proposed for a circuit that already exceeds 87.5% of the short circuit interrupting capability. Distribution protective devices and equipment include, but are not limited to, substation breakers, fuse cutouts, and line reclosers. This screen does not apply to level 1 applications except in situations where the addition of the DER would require the interrupting equipment to be modified to not improperly operate.
- vi. If the type of electrical service provided to the applicant, including line configuration and the transformer winding and connection limits the potential of the DER creating over-voltages on the electric utility's distribution system due to a loss of ground during the operating time of any anti-islanding function or during any fault condition. Projects implementing 3 phase ganged isolation that operate on ground detection, loss of phase detection, open phase detection or 3V0 protection and isolating may be reviewed to determine if they pass the screening.

Primary Distribution Line Type	Type of Interconnection to Primary Distribution Line	Result
3-phase, 3 wire	3-phase or single phase, phase-to-phase	Pass screen
3-phase, 4 wire	3-phase or single-phase, line-to-neutral	Pass screen
3-phase, 4 wire	3-phase or single phase, phase-to-phase	Fail screen

- vii. If the proposed DER is to be interconnected on single-phase shared secondary, the aggregate export capacity on the shared secondary, including the proposed DER export capacity, may not exceed 20 kWac or 65% of the transformer nameplate rating.
- viii. If the proposed DER is single-phase and is to be interconnected on a center tap neutral of a 240 volt service, its addition may not create an imbalance between the 2 sides of the 240 volt service of more than 20% of the nameplate rating of the service transformer.
- ix. If the proposed DER is single-phase and is to be interconnected to a 3-phase service, its nameplate rating may not exceed 10% of the service transformer nameplate rating.
- x. If the proposed DER's point of common coupling is behind a line voltage regulator, the aggregate DER on the line section plus the proposed DER's nameplate rating must be less than 250 kWac or the regulator rating, whichever is less. This screen does not include substation voltage regulators.
- xi. The aggregate DER export capacity on the line section plus the proposed DER export capacity, subject to inadvertent export screens, shall not exceed the day to day thermal limit of any distribution system component that serves the project or exceed the rated fault current limit of DTE equipment.
- xii. The project follows the DTE Service Installation Manual (SIM), Primary Service, Method Of Service (MOS) requirements and meets all requirements of electrical service.
- xiii. High voltage resonance screen. If the project is located on a delta ungrounded line, there must not be a single phase protective device upstream of the DER and any capacitors on the same line section.
- xiv. A three phase project must not have a single phase operating and isolation device at the POC/PCC
- xv. If the project intends to operate as an islanded microgrid, it must implement a single open break isolation wholly contained within the Applicant's service, such as an Auto Transfer Switch, implement mechanical interlocks that do not allow parallel operation or implement a hardware breaker controlled by DTE approved relaying. The microgrid must not rely on software based controls to manage power flow at the Point of Common Coupling during island operation. The microgrid must also implement open transition return to grid and follow return to service criteria or have appropriate synchronization relaying and controls approved by DTE for closed transition and provide SCADA points to DTE for required relaying.
- xvi. If the application is a subdivided premise in a master planned clustered development where the aggregate DER Capacity of the clustered development exceeds the interconnection level the application has applied for, the application will be evaluated with the context of the development's aggregate planned DER capacity.
- xvii. If the project is located within a section of a circuit that is identified as an area that has an operational jumpering or loop scheme, the addition of the DER does not render the jumpering or loop scheme inoperable due to loading or voltage violations.

### Anti Islanding screens

The following are the anti-islanding screens:

- i. For synchronous and induction type projects at Levels 3 - 5, DTE will determine whether the total generation within a protective zone is greater than 33% of the

minimum utility load that could be isolated along with the generation. In cases where it can be shown that self-excitation of the induction generator cannot occur when isolated from the DTE electric system, DTE may waive the requirement.

- ii. For inverter-based Projects at all Levels, DTE will determine whether the total generation within a protective zone is greater than two thirds of the minimum utility load that could be isolated along with the generation or whether synchronous generation accounts for greater than 25% of the inverter-based supply.

For all levels, if a project fails either (i) or (ii) above (as applicable), DTE will conduct a risk of islanding study as a supplemental study. Projects which fail the risk of islanding study may be required to install methods to mitigate this risk. The study process and acceptable methods are described in Section 3.16.

### **Inadvertent export screens**

To be eligible for the Fast Track, projects with export-limiting functionality enabled utilizing either certified inverters with PCS or a standalone PCS shall be screened as set forth below. Projects which fail any of the below screens will be subject to supplemental review or study. Any such studies will take into account the inverter's actual open loop response time (to the extent ascertainable) and will not assume an open loop response time of 30 seconds unless no actual response time can be determined.

- For all projects, inadvertent export shall be limited to no more than 30 seconds, as required for certification.
- For the purposes of the below “shared infrastructure” and “dedicated infrastructure” screens, “inadvertent-export-susceptible capacity” for a given DER shall mean the maximum electric capacity which a DER may introduce to the distribution system during an inadvertent export event, which may differ from either the nameplate or the inverter rating, depending on the configuration. The inadvertent-export-susceptible capacity of any DER employing relays to prevent inadvertent export shall be deemed to be zero.
  - Shared infrastructure screens:
    - For projects with an inadvertent-export-susceptible capacity of up to 20 kWac, the aggregate inadvertent-export-susceptible capacity of the proposed project, plus the existing aggregate inadvertent export-susceptible capacity of DERs interconnected on shared infrastructure, shall not exceed 300% of the lowest day-to-day system equipment rating on the shared infrastructure.
    - For projects with an inadvertent-export-susceptible capacity greater than 20 kWac, the aggregate inadvertent-export-susceptible capacity of the proposed project, plus the existing aggregate inadvertent-export-susceptible capacity of DERs interconnected on the shared infrastructure, shall not exceed 200% of the lowest day-to-day system equipment rating on the shared infrastructure.
    - No single project's inadvertent-export-susceptible capacity may exceed 200% of the lowest day-to-day system equipment rating on the shared infrastructure.
  - Dedicated Infrastructure Screens:

- For projects with an inadvertent-export-susceptible capacity of 1 MWac or less, the total inadvertent-export-susceptible capacity of such project shall not exceed 200% of the lowest day-to-day system equipment rating on the dedicated secondary circuit.
  - For projects with an inadvertent-export-susceptible capacity above 1 MWac, the total inadvertent-export-susceptible capacity shall not exceed 120% of the lowest day-to-day system equipment rating on the dedicated secondary circuit.
- Voltage variation shall not exceed 5% from inadvertent export measured at the transformer or point of shared secondary for secondary connected projects or 3% measured at the point of connection on the primary for primary connected projects, based on Formula 1 below. If Relay protected DER are present, the full capacity of the relay protected project(s) shall be used for assessing voltage impacts, but limited to the duration of the relay operation based on its settings.

Formula 1:

<b>Formula</b>	$\frac{(R_{SOURCE} \times \Delta P) - (X_{SOURCE} \times \Delta Q)}{V^2}$
<p><b>Where:</b></p> <p><math>\Delta P = (\text{DER apparent power Nameplate Rating} - \text{Export Capacity}) \times \text{PF}</math>,  <math>\Delta Q = (\text{DER apparent power Nameplate Rating} - \text{Export Capacity}) \times \sqrt{(1 - \text{PF}^2)}</math>,  <math>R_{SOURCE}</math> is the grid resistance, <math>X_{SOURCE}</math> is the grid reactance,  <math>V</math> is the grid voltage, PF is the power factor</p>	

## **APPENDIX I: SUPPLEMENTAL REVIEW SCREENS**

The supplemental review screens are all of the following:

**Minimum load screen.** Where 12 months of line section minimum load data, including onsite load but not station service load served by the proposed DER, are available, can be calculated, can be estimated from existing data, or can be determined from a power flow model, the aggregate DER capacity on the line section must be less than 100% of the minimum load for all line sections bounded by automatic sectionalizing devices upstream of the proposed DER. If minimum load data are not available, or cannot be calculated, estimated, or determined, DTE shall include the reason or reasons that it is unable to calculate, estimate, or determine minimum load in its supplemental review results notification. All of the following must be applied:

- (i) The type of generation used by the proposed DER will be considered when calculating, estimating, or determining circuit or line section minimum load relevant for the application of the minimum load screen specified in this subdivision. Solar photovoltaic generation systems with no energy storage must use daytime minimum load. All other generation must use absolute minimum load unless an operating schedule is provided.
- (ii) When this screen is being applied to a DER that serves some station service load, only the net injection of electric energy into the electric utility's distribution system may be considered as part of the aggregate generation.
- (iii) The electric utility shall not consider as part of the aggregate generation, for purposes of this supplemental screen, DER capacity known to be already reflected in the minimum load data.

**Voltage and power quality screen.** In aggregate with existing generation on the line section, all of the following conditions must be met:

- (i) The voltage regulation on the line section can be maintained in compliance with relevant requirements under all system conditions.
- (ii) The voltage fluctuation is within acceptable limits as defined by the IEEE Standard 1453-2015, IEEE Recommended Practice for the Analysis of Fluctuating Installations on Power Systems.

ii.

**Safety and reliability screen.** The location of the proposed DER and the DER capacity on the line section may not create impacts to safety or reliability that require application of the study track to address. DTE shall consider all of the following when determining potential impacts to safety and reliability in applying this screen:

- (i) Whether the line section has significant minimum loading levels dominated by a small number of customers, such as several large commercial customers.
- (ii) Whether the loading along the line section is uniform.
- (iii) Whether the proposed DER is located less than 0.5 electrical circuit miles for less than 5 kV or less than 2.5 electrical circuit miles for greater than 5 kV from the substation. In addition, the day to day thermal rating of the line section from the substation to the point of common coupling.
- (iv) If the proposed interconnection will connect to a power line or feeder cable
- (v) Whether the proposed DER incorporates a time delay function to prevent reconnection of the DER to the distribution system until distribution system voltage and frequency are within normal limits for a prescribed time.
- (vi) Whether operational flexibility is reduced by the proposed DER, such that transfer of the line section or sections of the DER to a neighboring distribution circuit or substation may trigger overloads, power quality issues, or voltage issues.
- (vii) Whether the proposed DER employs equipment or systems certified by a recognized standards organization to address technical issues including, but not limited to, islanding, reverse power flow, or voltage quality.
- (viii) Whether the proposed project will increase existing power quality issues on the circuit.

- (ix) Whether voltage regulators, or load tap changers are adversely impacted or risk being damaged by reverse power flow from over excitation, excessive operation or improper regulation behavior leading to their failure or power quality and voltage impacts to other customers.
- (x) Whether the service at the premise is able to operate safely with the additional generation provided by the project.
- (xi) Whether the service or transformer could experience a overload or out of range voltage when there are other existing projects on the same service transformer.
- (xii) Whether there is a risk of islanding screen to determine if additional protection, communications or operating devices are required to prevent unintentional islanding

**APPENDIX J: PRE-APPLICATION REPORT FORM**

## APPENDIX K: VOLTAGE RANGES

Voltage Class	Nominal Voltage (V)
Secondary	120/240
	120/208
	240
	277/480
	480
Distribution	4,800
	8,320
	13,200
Sub transmission	24,000
	41,570 (40KV)

# APPENDIX L: INSURANCE REQUIREMENTS

## CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

**IMPORTANT:** If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Insurance Company Address	CONTACT NAME: <b>Insurer Contact Name</b> PHONE (A/C, No, Ext): <b>###-###-####</b> FAX (A/C, No): <b>###-###-####</b> E-MAIL ADDRESS: <b>name@insurance.com</b> INSURER(S) AFFORDING COVERAGE INSURER A: <b>Insurer Company A</b> NAIC # <b>#####</b> INSURER B: <b>Insurer Company B</b> INSURER C: INSURER D: INSURER E: INSURER F:
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**COVERAGES**      **CERTIFICATE NUMBER:**      **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDITIONAL INSURER (IND. W/P)	POLICY NUMBER	POLICY EFF. (MM/DD/YYYY)	POLICY EXP. (MM/DD/YYYY)	LIMITS
A	<input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR  GEN'L AGGREGATE LIMIT APPLIES PER: <input type="checkbox"/> POLICY <input checked="" type="checkbox"/> PRODUCE <input type="checkbox"/> LOC <input type="checkbox"/> OTHER	Y	#####	MM/DD/YYYY	MM/DD/YYYY	EACH OCCURRENCE \$ <b>1,000,000</b> DAMAGE TO RENTED PREMISES (EA OCCURRENCE) \$ MED EXP (Any one person) \$ PERSONAL & ADV INJURY \$ <b>2,000,000</b> GENERAL AGGREGATE \$ <b>2,000,000</b> PRODUCTS - COMP/OP AGG \$ <b>2,000,000</b>
A	AUTOMOBILE LIABILITY <input type="checkbox"/> ANY AUTO <input type="checkbox"/> SCHEDULED AUTOS <input type="checkbox"/> OWNED AUTOS ONLY <input type="checkbox"/> NON-OWNED AUTOS ONLY <input type="checkbox"/> HIRED AUTOS ONLY		Not required by DTE			COMBINED SINGLE LIMIT (EA ACCIDENT) \$ BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$
A	UMBRELLA LIAB <input type="checkbox"/> OCCUR EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE DED <input type="checkbox"/> RETENTION \$		Not required by DTE			EACH OCCURRENCE \$ AGGREGATE \$
A	WORKERS COMPENSATION AND EMPLOYER'S LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/OWNER EXCLUDED? (Mandatory in MI) If yes, describe under DESCRIPTION OF OPERATIONS below	Y/N	N/A	Y	Recommended by DTE	PER STATUTE / OTHER E.L. EACH ACCIDENT \$ <b>1,000,000</b> E.L. DISEASE - EA EMPLOYEE \$ <b>1,000,000</b> E.L. DISEASE - POLICY LIMIT \$ <b>1,000,000</b>

DESCRIPTION OF OPERATION(S) / LOCATION(S) / VEHICLE(S) (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)  
**Location:**

<b>CERTIFICATE HOLDER</b>  DTE Energy, DTE Electric and all other affiliates 1 Energy Plaza  Detroit, MI 48226	<b>CANCELLATION</b>  SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.  AUTHORIZED REPRESENTATIVE <i>signed</i>
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## **APPENDIX M: COMPANY HOLIDAYS**

New Year's Day (observed)

Martin Luther King Day

Good Friday

Memorial Day

Independence Day

Labor Day

Thanksgiving

Day after Thanksgiving

Christmas Eve (observed)

Christmas Day (observed)

New Year's Eve (observed)

**APPENDIX N: EXAMPLE INTERCONNECTION  
RELAY/INVERTER TEST PLAN**

**DTE**  
**MICHIGAN ELECTRIC UTILITY**  
**Distributed Generation Tariff (Rider 18)**  
**and Legacy Net Metering (Rider 16)**  
**supplemental interconnection**  
**Procedures**  
*November 6, 2025*

These procedures are in addition to the Standard Interconnection procedures and define specific program requirements or policies. Applicants must first comply with and follow the base interconnection requirements applicable to their project. Procedures in this document are in addition to the base procedures and specific exceptions may be defined in this document as part of the program.

### **Section 1. Applicability**

1. These supplemental procedures apply to Customers seeking to apply for interconnection and applying for DG Tariff Rider 18 or Customers on existing Rider 16 seeking to add battery storage to their site, in each case utilizing a UL certified system where total on-site generation does not exceed 550 kW

### **Section 2. Fee Adjustments**

1. There are no additional application fees for this program. Study or construction fees may apply. For additional information on fees, see the applicable standard interconnection procedures.

### **Section 3. Review Process for Distributed Generation Program Consideration**

1. The procedure below is DTE Electric’s (“Company”) review process for eligibility for its customers to participate in its distributed generation program Rider (18). Rider 16 is closed to new applicants. It provides additional context to the DTE Electric Rate book for Electric Service. The following methods further clarify an “eligible generator” and the determining factors for application approval.
2. Expected generation is the estimated electric power produced by a renewable generator or aggregation of generators. For the purposes of these supplemental procedures, regarding Distributed Generation Program qualification, a battery energy storage system will not be considered a generator or contribute to on-site generation. For solar generation, expected generation is the lesser of either the formula-based or model based methods, described below:

- a. Formula based:

$$\begin{aligned} \text{Annual Adjusted Consumption} &= \text{Total Annual Consumption} * 1.1 \\ \text{Expected Generation} &= \text{Total Generator Nameplate Capacity (DC)} * 0.1274 * 8760 \\ \text{Expected Generation} &\leq \text{Annual Adjusted Consumption} \end{aligned}$$

- b. Model based:

Calculated within PowerClerk, incorporating the effects of panel orientation and customer roof angle.

3. Projects are subject to the absolute cap of 550 kW generation capacity for these programs.
4. A generator is deemed “eligible” for program participation when expected generation does not exceed 110% of the annual electric consumption as measured in kWh (“kWh consumption”) of the tariff specific meter, the generator is renewable in nature, and no source of non-renewable generation will be part of the aggregate interconnection.
5. Upon implementation of this method, for projects that have already been approved under Rider 18 or net metering using historically applied AC rating sizing criteria no change will occur. However, upon any proposed modification to aggregate DER on the site that is a material modification requiring a new interconnection application under R 460.984, the new application and aggregate DER will be reviewed under the new DC sizing method. The applicant will be given the choice of maintaining their current system and withdrawing the application or proceeding with the new application and having the DC calculation performed for the aggregate site generation. This Section 3.6 is subject to the provisions of Section 5 below, and Section 5 shall control in the event of a conflict between this Section 3.6 and Section 5.
6. Other methods can be employed to derive expected generation if acceptable documentation or sufficient data is provided to support, with common scenarios listed below.

*i. Customer has 12 months of consumption*

An eligible generator is “Approved” based on one of the following:

1. Expected Generation does not exceed the customer’s most recent 12-month kWh consumption from the review date.
2. Expected Generation is sized to meet criteria 1 with additional documentation (a or b) that substantiates additional load, at the Company’s discretion.
  - a. Evidence of additional load may include receipts of newly purchased electric vehicle with electric vehicle charger/major appliances/machinery dated from no greater than 90 days (3 months) before date of review.
  - b. Receipts that are time-stamped with a date and/or written summary that justifies a timestamp that exceeds 3 months.
3. Expected Generation does not exceed the customer’s 12-month kWh consumption history from a previous year with a summary and/or documentation validating a lifestyle change. Ex. Unexpected length of time where the site was unoccupied.

*ii. Customer has at least 6 months of consumption but less than 12 months*

An eligible generator is subject to be “Approved” by DTE, based on one of the following:

1. Expected Generation does not exceed the customer’s average monthly kWh consumption multiplied by 12.

2. Expected Generation does not exceed the customer's average monthly kWh consumption multiplied by 12 (omitting 1-2 outlier months).
3. Expected Generation does not exceed the customer's average kWh consumption multiplied by 12 (omitting up to 6 outlier months) with a summary and /or documentation validating a lifestyle change. Ex. Unexpected length of time where the site was unoccupied.

*iii. Customer has less than 6 months of consumption*

An eligible generator is subject to be "Approved" by DTE, based on one of the following:

1. Along with customer's monthly consumption, a submission that includes documents indicating square footage of the building, a load estimation sheet, and a summary and /or documentation validating a lifestyle change. Ex. Unexpected length of time where the site was unoccupied.
2. Along with customer's monthly consumption, a submission that includes any combination of receipts, that reasonably validate expected generation would not exceed load with context of existing load.
3. Along with customer's monthly consumption, a submission that includes any combination of an Electrical Scope of Work, Electric Panel Diagram, Blueprint, and receipts that reasonably validates expected generation would not exceed load.

*iv. Customer has 0 months of recorded consumption on the account*

An eligible generator is subject to be "Approved" by DTE, based on one of the following:

a. New Construction

- i. Submission that includes any combination of an Electrical Scope of Work, Electric Panel Diagram, Blueprint, and receipts that reasonably validates expected generation would not exceed load.
- ii. Review of the request for service or Method of Service to DTE to determine expected load.

b. Other Projects

- i. Submission that includes any combination of receipts, that reasonably validate expected generation would not exceed load.

#### **Section 4. Metering Provision**

1. Upon successful site visit, the customer meter will be configured to be bi-directional to measure inflow and outflow. A generation meter is recommended but not required. Projects that have specific relaying or protection schemes that are identified during interconnection study or facilities upgrade may require a production meter that measures

the generation exclusively and the applicant should provide any appropriate equipment including metering bases, CT cabinets and disconnects as defined in the SIM manual and the construction agreement.

## **Section 5. Legacy Net Metering Generation Program System Modification & Distributed Generation Battery Storage Policy**

1. Pursuant to the DTE Electric (“Company”) Electric Rate Book (“Rate Book”), the procedure below provides the review processes for Rider 18 program eligibility with battery storage and for modifying an existing generating facility taking service under either Rider 16 or Rider 18.
2. Per the DTE Electric Rate Book, an existing Legacy Net Metering customer will become subject to the terms and conditions of the Distributed Generation Program if an increase to aggregate generation occurs. A battery energy storage system is not considered a generator or to contribute to on-site generation. An increase to aggregate generation includes one of the following:
  - i. Additional generation capacity (kW) has been installed on the local area system which has been approved for Legacy Net Metering.
  - ii. An existing generator has been modified to increase the AC or DC nameplate rating.
3. Additional consideration to maintain Legacy Net Metering eligibility status may be reviewed at the Company’s discretion for modifications involving:
  - i. Added power or operational capacity (kW) to the DC nameplate dedicated solely for backup battery storage and that will not be able to operate in parallel with the distribution system..
  - ii. Added power or operational capacity (kW) to the DC nameplate with inoperable ability to provide energy to the electric grid.
4. General Tariff Eligibility Provisions:
  - i. Legacy Net Metering Eligibility When Adding Battery Storage: When determining whether a customer adding Battery Storage may maintain Legacy Net Metering (Rider 16) eligibility, DTE Electric will not include the kWh contribution from an energy storage device for purposes of the “Base Rate self-service needs” limitation in Section B(2) of the Eligible Electric Generating Units provision of Rider 16, and DTE will not include the export or nameplate capacity of an energy storage device for purposes of the AC system size limitations under Section B(1) of the Eligible Electric Generating Units provision of Rider 16. Notwithstanding the foregoing, the addition of energy storage shall not be permitted to cause any increase in the total number of kWh a customer's DER is

capable of generating and/or exporting to the grid on an annual basis. This paragraph applies regardless of whether an energy storage device and distributed generator utilize the same inverter (DC coupled) or separate inverters (AC coupled). An existing Legacy Net Metering Customer filing a new interconnection application shall not lose their access to Legacy Net Metering as long as the application complies with the technical requirements in section 5.4.iii

- ii. Distributed Generation Program Eligibility When Adding Battery Storage: When determining whether a customer adding Battery Storage may maintain eligibility for Rider 18 (and any successor tariffs subject to the requirements of MCL 460.1173), DTE Electric will not include the kWh contribution from an energy storage device for purposes of the 110% limitation in MCL 460.1173(2) or the export or nameplate capacity of an energy storage device for purposes of applying the DG program capacity allocations in MCL 460.1173(3)(a) and (b). This paragraph applies regardless of whether an energy storage device and distributed generator utilize the same inverter (DC coupled) or separate inverters (AC coupled). An existing Distributed Generation Customer filing a new interconnection application shall not lose their access to Rider 18 (or any successor tariffs subject to the requirements of MCL 460.1173) as long as the application complies with the technical requirements in section 5.4.iii
  - iii. Adding Battery Storage to an Existing System:  
For customers grandfathered under Rider 16, or for existing customers on Rider 18, so long as the total amount of energy that the system is capable of generating annually does not change, energy storage may be added in one of the three situations described below, and subject to all preceding provisions under Section 5.
    - a. Adding a new inverter with storage only, with appropriate metering, controls and settings to meet the requirements of sections 5.7, 5.8, or 5.9 (as applicable) for the site without any other modifications to the existing system.
    - b. Replacing the existing inverter with a new one that supports the storage as long as the total generation does not change and the total export capacity does not change, and the maximum nameplate export does not change, with no other modifications to the existing system.
    - c. Adding storage to an existing inverter that supports storage connections with no other modifications to the existing system, with appropriate metering, controls and settings to meet the requirements of sections 5.7, 5.8, or 5.9 (as applicable) for the site.
  - iv. For Projects level 3 and above, a third party testing report is required to validate settings and functionality during the commissioning phase, similar to how a relay report is required when relay protection is utilized. See Example Interconnection Relay/Inverter Test Plan **Appendix N** in the Interconnections Procedures.
5. A Battery Energy Storage System in both the Legacy Net Metering and Distributed Generation programs must comply with the following:

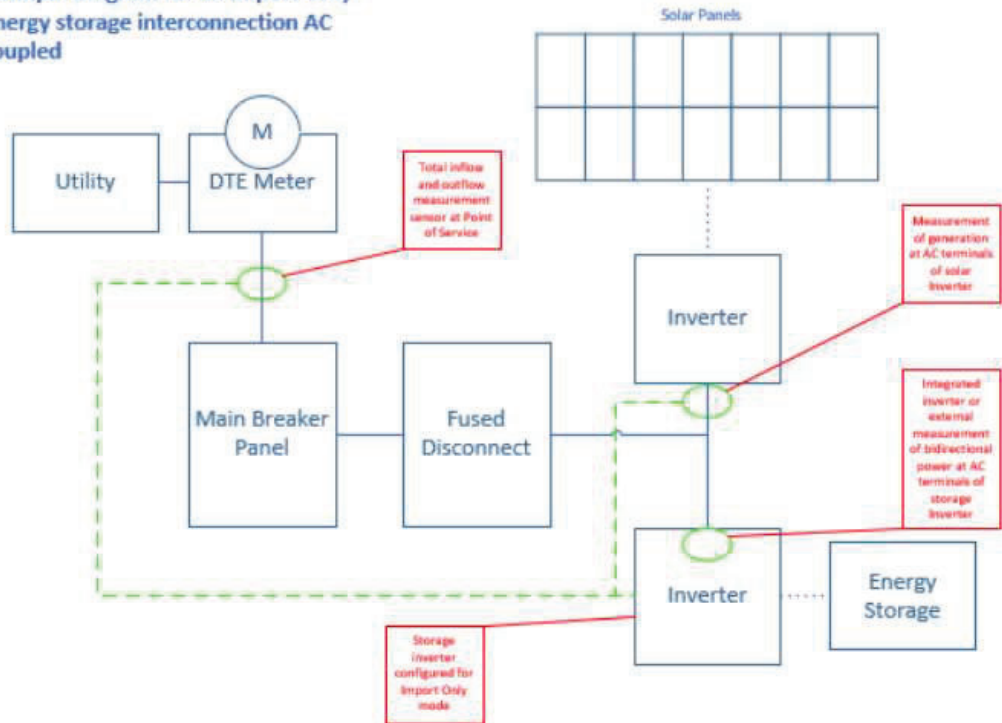
- i. Meet certification and interconnection requirements in the interconnection procedures.
  - ii. Operate in an acceptable storage mode (refer to Acceptable Battery Energy Storage System Modes below).
  - iii. Include specification sheets and manufacturers guide with application submission.
  - iv. Meet any other legacy net metering, distributed generation, or interconnection requirements as indicated in the Rate Book, Michigan Public Service Commission (“MPSC”) rules, the Interconnection and Parallel Operating Agreement, the Generator Interconnection & Operating Agreement, the Michigan Electric Utility Generator Interconnection Procedures, the Michigan Generator Interconnection Requirements, and other relevant law.
6. Acceptable Battery Energy Storage System Modes. The allowable battery energy storage system modes are the following:
- i. Import-only
  - ii. Export-only
  - iii. No-exchange

A customer shall specify the battery energy storage system mode in the interconnection application. Any future change to the battery energy storage system mode shall require a new program application.

7. Technical requirements for eligibility for Riders 16 and 18 in Import-Only Mode:
- i. A battery energy storage system shall be physically configured and set to operate in an import only mode (or its substantial equivalent) according to manufacturer instructions. For the purposes of this paragraph, “import only mode (or its substantial equivalent)” means a system configuration that is designed to ensure that the battery does not send energy back to the grid.
  - ii. The battery energy storage system shall be configured with sensors capable of isolating the input and output of the battery energy storage system exclusive of any loads or generation on the customer’s site to determine if, at any single point in time, the battery energy storage system is charging or discharging.
  - iii. A sensor shall be installed on the service entrance conductors between the utility meter and the customer’s main service panel that measures the total inflow and outflow at the customer’s service and is interfaced with the battery energy storage system’s control system.
  - iv. The battery energy storage system’s control system shall be capable of receiving the inputs from the sensors described in Sections 5.7.ii. and 5.7.iii. above. In any case that the relevant sensors detect that the battery energy storage system is discharging and that the net flow at the point of service is zero or is flowing out to the grid, the battery energy storage system shall reduce discharge or cease discharging immediately to ensure no battery energy is exported to the grid.

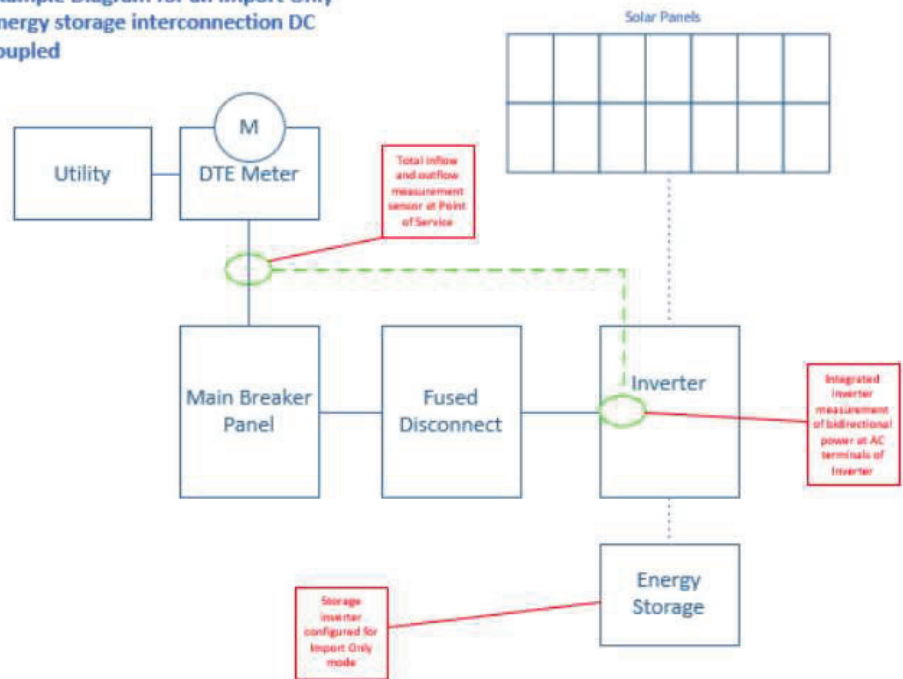
- v. The battery energy storage system shall comply with any other limits applicable to the terms of its interconnection.
- vi. For AC-coupled battery energy storage systems, the sensors required by Sections 5.7.ii. and 5.7.iii. above shall be placed (a) at the battery energy storage system AC terminals, (b) at the terminals of generating inverters and (c) at the point of service.

**Example Diagram for an Import Only energy storage interconnection AC coupled**



- vii. For DC-coupled battery energy storage systems that are combined with generation, the sensors required by Sections 5.7.ii. and 5.7.iii. above shall be placed (a) at the AC terminals of the shared inverter and (b) at the point of service.

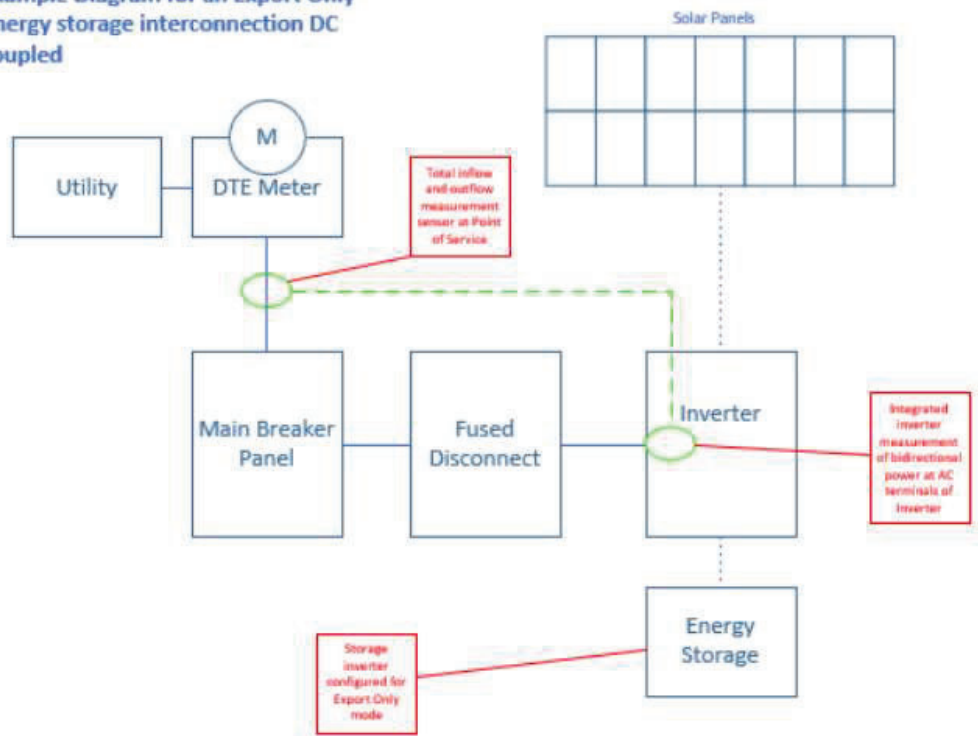
Example Diagram for an Import Only energy storage interconnection DC coupled



- viii. Sensor placement, phasing, direction, make and model of sensors or other power control system equipment shall be clearly labelled on one lines and three lines (as applicable), indicating exactly where each measurement is taking place and how it is communicated to the battery energy storage system’s control system. To the extent that any sensor required by Section 5.7.ii. (as further defined in Sections 5.7.vi and 5.7.vii) is internal to an inverter or control system, it shall be sufficient to state on the one lines and three lines (as applicable) and provide the applicable manufacturer wiring diagram showing such measurement points.
  - ix. Photographs of the battery energy storage system, associated equipment and measurement points will be required during construction to ensure proper system installation and alignment to the approved application.
8. Technical requirements for eligibility for Riders 16 and 18 in Export-Only Mode:
- i. A battery energy storage system shall be physically configured and set to operate in an export only mode (or its substantial equivalent) according to manufacturer instructions. For the purposes of this paragraph, “export only mode (or its substantial equivalent)” means a system configuration that is designed to ensure that the battery does not charge from the grid.
  - ii. The battery energy storage system shall be configured with sensors capable of isolating the input and output of the battery energy storage system exclusive of any loads or generation on the customer’s site to determine if, at any single point in time, the battery energy storage is charging or discharging.

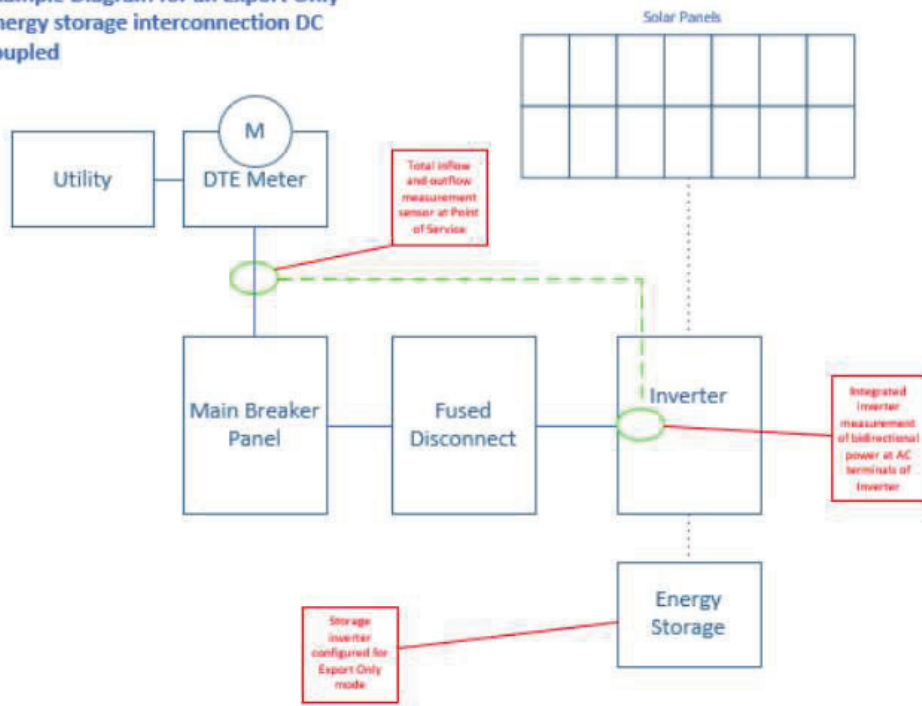
- iii. A sensor shall be installed on the service entrance conductors between the utility meter and the customer's main service panel that measures the total inflow and outflow at the customer's service and is interfaced with the battery energy storage system's control system.
- iv. The battery energy storage system's control system shall be capable of receiving the inputs from the sensors described in Sections 5.8.ii. and 5.8.iii. above. In any case that the relevant sensors detect that the battery energy storage system is charging and that the net flow at the point of service is zero or is flowing in from the grid, the battery energy storage system shall reduce charging or cease charging immediately to ensure no grid energy is used to charge the battery energy storage system.
- v. The battery energy storage system shall comply with any other limits applicable to the terms of its interconnection.
- vi. For AC-coupled energy storage systems, the sensors required by Section 5.8.ii. and 5.8.iii. above shall be placed (a) at the battery energy storage system AC terminals, and (b) at the terminals of generating inverters, and (c) at the point of service.

**Example Diagram for an Export Only energy storage interconnection DC coupled**



- vii. For DC-coupled battery energy storage systems that are combined with generation, the sensors required by Section 5.8.ii. and 5.8.iii. above shall be placed (a) at the AC terminals of the shared inverter and (b) at the point of service.

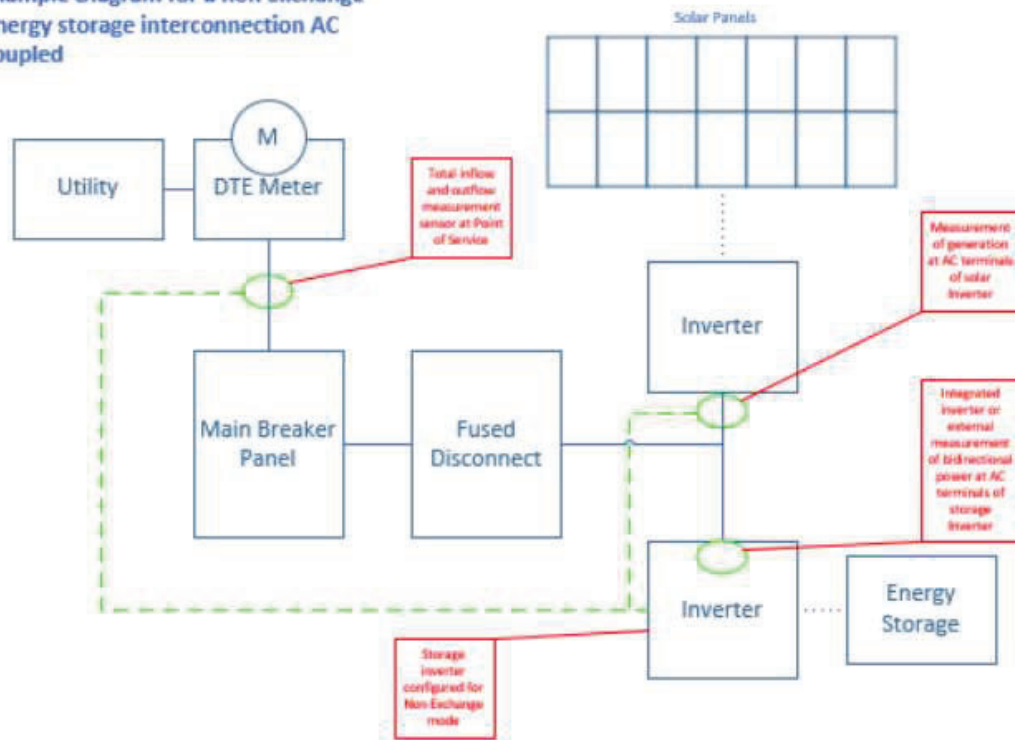
Example Diagram for an Export Only energy storage interconnection DC coupled



- viii. Sensor placement, phasing, and direction, make and model of sensors or other power control system equipment shall be clearly labelled on one lines and three lines (as applicable), indicating exactly where each measurement is taking place and how it is communicated to the battery energy storage system’s control system. To the extent that any sensor required by Section 5.8.ii. (as further defined in Sections 5.8.vi. and 5.8.vii.) is internal to an inverter or control system, it shall be sufficient to state on the one lines or three lines (as applicable) and provide the applicable manufacturer wiring diagram showing such measurement points.
  - ix. Photographs of the battery energy storage system, associated equipment and measurement points will be required during construction to ensure proper system installation and alignment to the approved application.
9. Technical requirements for eligibility for Riders 16 and 18 in No-Exchange Mode:
- i. A battery energy storage system shall be physically configured and set to operate in a no-exchange mode (or its substantial equivalent) according to manufacturer instructions. For the purposes of this paragraph, “no-exchange mode (or its substantial equivalent)” means a system configuration that is designed to ensure that the battery does not charge from the grid or discharge to the grid.
  - ii. The battery energy storage system shall be configured with sensors capable of isolating the input and output of the battery energy storage system exclusive of any loads or generation on the customer’s site to determine if, at any single point in time, the battery energy storage system is charging or discharging.

- iii. A sensor shall be installed on the service entrance conductors between the utility meter and the customer's main service panel that measures the total inflow and outflow at the customer's service and is interfaced with the battery energy storage system's control system.
- iv. The battery energy storage system's control system shall be capable of receiving the inputs from the sensors described in Sections 5.9.ii. and 5.9.iii. above. In any case that the relevant sensors detect (a) that the battery energy storage system is charging and the net flow at the point of service zero or is flowing in from the grid or (b) that the battery energy storage system is discharging and that the net flow at the point of services is zero or flowing out to the grid, the battery energy storage system shall reduce charging or discharging or cease operating (in each case as applicable) to ensure that no battery energy is exported to the grid or that no grid energy is used to charge the battery energy storage system (as applicable).
- v. The battery energy storage system shall comply with any other limits applicable to the terms of its interconnection.
- vi. For AC-coupled energy storage systems, the sensors required by Section 5.9.ii and 5.9.iii. above shall be placed (a) at the battery energy storage system AC terminals, (b) at the terminals of generating inverters, and (c) at the point of service.

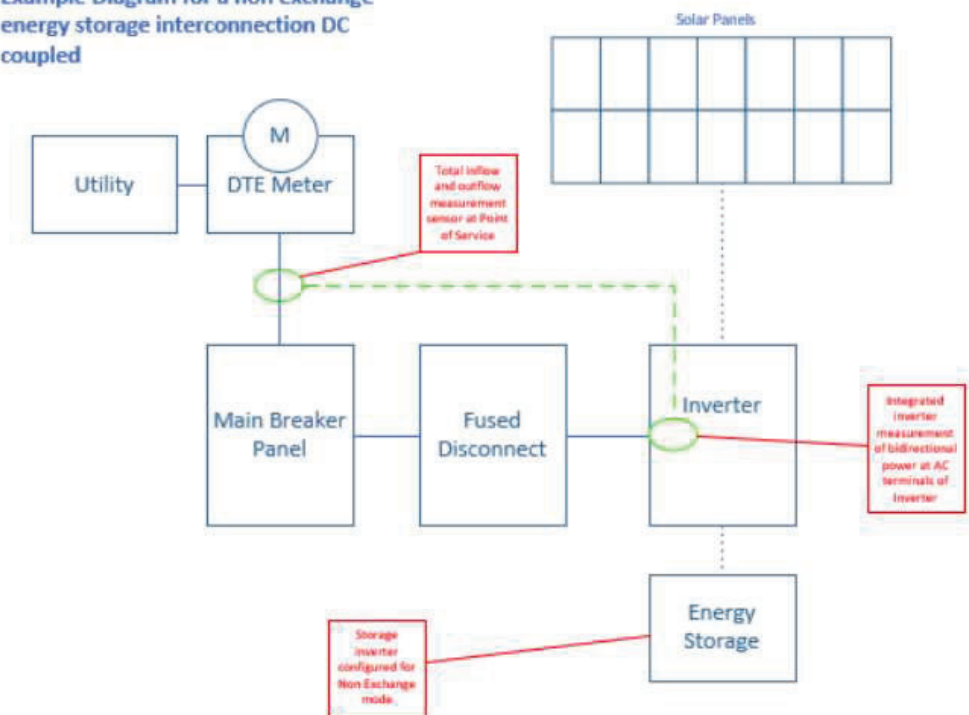
Example Diagram for a non exchange energy storage interconnection AC coupled



- vii. For DC-coupled energy storage systems that are combined with generation, the sensors required by Section 5.9.ii. and 5.9.iii. above shall be placed (a) at the AC terminals of the

shared inverter and (b) at the point of service.

**Example Diagram for a non exchange energy storage interconnection DC coupled**



- viii. Sensor placement, phasing, and direction, make and model of sensors or other power control system equipment shall be clearly labelled on one lines and three lines (as applicable) indicating exactly where the measurement is taking place and how it is communicated to the battery energy storage system’s control system. To the extent that any sensor required by Section 5.9.ii. (as further defined in Section 5.9.vi. and 5.9.vii.) is internal to an inverter or control system, it shall be sufficient to state on the one lines and three lines (as applicable) and provide the applicable manufacturer wiring diagram showing such measurement points.
  - ix. Photographs of the battery energy storage system, associated equipment and measurement points will be required during construction to ensure proper system installation and alignment to the approved application.
10. Conditions that would require a change from Legacy Net Metering to DG tariff
- i. Addition of any new DC generation source (i.e., additional or different panels)
  - ii. Replacement of the existing approved inverter with a different make or model where the AC export capacity is higher than previously approved.
  - iii. A change to the existing power limiting setting
  - iv. Other material modifications of the system that change the generation or export capacity.

11. Failure to adhere to the Company's policies regarding Battery Storage will be subject to the Company Termination of the Net Metering and Distributed Generation rules as detailed in Rate Book.

**Section 6. Exceptions to base interconnection procedures**

None.

**ATTACHMENT A: CONSTRUCTION AGREEMENT**  
**For Generator Interconnection to DTE Electric’s System**  
**BETWEEN DTE ELECTRIC COMPANY**  
**AND**  
**Project Name (DE-#####)**

WHEREAS, DTE Electric received from \_\_\_\_\_ (“Project Developer”) submitted by agent \_\_\_\_\_ a ### kW / ### kVA generator interconnection application with an export capacity of ### kW and information concerning Project Developer’s project (“Interconnection Request”) for a Level # project for a system of type \_\_\_\_\_ for a generator of type \_\_\_\_\_ proposing to interconnect at \_\_\_\_\_ location with project number DE-#### assigned by DTE Electric on MM/DD/YYYY.

(DTE Electric and Project Developer may be referred to individually as a “Party” or, collectively, as the “Parties.”); and

WHEREAS, This Agreement does not address the sale of electricity to or from DTE; and

WHEREAS, This Agreement does not address the operation of Interconnection Project; and

WHEREAS, This Agreement does not Authorize the Interconnection to operate in Parallel with the DTE Electric System; and

WHEREAS DTE Electric has determined that its distribution system requires modification and/or construction to accommodate the proposed Interconnection Project (referred to collectively as the “Distribution System Upgrades”) as identified in Appendix A.

NOW, THEREFORE, in consideration of the mutual covenants and agreements herein set forth, DTE Electric and Project Developer agree to enter into this Agreement and agree as follows:

1. The scope and the estimated cost for the Distribution System Upgrades are identified in Appendix A of this agreement. Project Developer shall pay DTE Electric the estimated costs for Distribution System Upgrades identified in Appendix A of this agreement (“Estimated Costs”). Upon authorization of the Interconnection Project, DTE Electric will charge Project Developer and Project Developer will pay for the Actual Costs<sup>1</sup> to design, procure, modify and/or construct the Distribution System Upgrades, and commission the Interconnection Project. If the cost to the applicant for interconnection facilities will exceed 110% of the estimate, DTE Electric will provide a summary and explanation of the costs prior to being incurred. If the cost for interconnection facilities will exceed 125% of the estimate, DTE Electric will consult with the Applicant to get consent to continue.

2. Project Developer shall have Thirty (30) business days from [MM/DD/YYYY](#) to execute and return this Agreement to DTE Electric along with the payment of the Estimated Costs either in full or according to any payment milestones described in Appendix B. If Project Developer does not execute and return this Agreement and pay the Estimated Costs, a single fifteen (15) day extension will be granted. At the expiration of this extension, this Agreement shall terminate, the interconnection agreement shall be considered withdrawn and Project Developer shall submit a new interconnection application in accordance with R460.960
  
3. The term of this Agreement shall commence as of the date DTE Electric receives the executed Agreement together with payment in full of the Estimated Costs (or according to milestones in Appendix B of this agreement) and shall terminate upon the earlier of (i) satisfaction of all of the obligations of both Parties under this Agreement, (ii) Project Developer's termination of this Agreement as provided herein, or (iii) DTE Electric's authorization of the Interconnection Project as provided herein.
  
4. DTE Electric will use commercially reasonable efforts to complete the Distribution System Upgrades in accordance with the Accepted Project Schedule. The Accepted Project Schedule will be extended to the extent Project Developer suspends or delays the Distribution System Upgrades or DTE Electric is delayed by severe weather, strikes, supply chain issues, and other events of similar or dissimilar nature beyond the reasonable control of DTE Electric.
  
5. ALL WARRANTIES CONCERNING THE DISTRIBUTION SYSTEM UPGRADES OR ANY LABOR, PARTS, EQUIPMENT, OR MATERIALS PROVIDED IN CONNECTION THEREWITH, EXPRESS OR IMPLIED, ARE EXCLUDED, INCLUDING THE IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, AND ANY WARRANTY ARISING FROM COURSE OF DEALING, USAGE OF TRADE, DESCRIPTION, OR SAMPLE.
  
6. During performance of the Distribution System Upgrades, DTE Electric may, upon reasonable request of Project Developer, provide an update on the Distribution System Upgrades and/or the Actual Costs incurred pursuant to this Agreement.
  
7. During the construction by the project developer of their project, should they make a change to their site, the project developer shall inform DTE Electric of said change. If that change impacts the Distribution system upgrades, DTE Electric will provide the project developer with a new cost estimate and a new schedule. Failure by the project developer to inform DTE will result in project delays and may result in the termination of this agreement.
  
8. The project developer shall notify DTE Electric of any injury that occurs on site within 24 hours, and of any unsafe conditions on the site immediately. DTE Electric has the right to suspend work until the injury is explained or the unsafe condition rendered safe. Should DTE

Electric find an unsafe condition, they will notify the project developer or their designated agent immediately.

9. Project Developer may terminate this Agreement upon ten (10) days written notice to DTE Electric. In such event, Project Developer shall be responsible for all costs incurred by DTE Electric through the date of such termination, including but not limited to actual costs, any cancellation costs relating to orders or contracts for materials and equipment, costs to remediate partial or temporary construction to good working order, costs for any portion of the materials and/or equipment installed or constructed as of the date of such termination, all costs associated with the removal, relocation, reconfiguration, or other disposition or retirement of such materials, equipment, or facilities, and other expenses DTE Electric has incurred regarding the Distribution System Upgrades through the date of termination (referred to collectively as "Termination Costs"). DTE Electric will deduct all Termination Costs from the Estimated Costs paid by Project Developer upon execution of this Agreement and refund any difference as provided herein unless the Termination Costs exceed the Estimated Costs, and in such case, Project Developer shall pay the difference. In the event Project Developer terminates this Agreement as provided herein, Project Developer shall submit a new interconnection request if such service is required.

10. Upon completion of the Distribution System Upgrades and receipt of notification from Project Developer that installation of Project Developer's equipment and any required onsite testing, local code inspection and approval is complete, DTE Electric will schedule a site visit to inspect the project and witness or perform commissioning tests on Project Developer's protective equipment required by IEEE1547.1-2020, National Electric Code (NEC), National Electric Systems Code (NESC) and Good Utility Practices. Five days after the DTE internal commissioning test report is reviewed, DTE Electric will notify the Project Developer of its approval or disapproval of the interconnection. If approved, DTE Electric will provide the Project Developer with a written statement of final approval and Authorization for Parallel Operation. If not approved, DTE Electric will notify the Project Developer of the necessary corrective actions required for approval. The Project Developer, after taking corrective action, shall provide a written notification to DTE Electric. If DTE Electric is responsible for the corrective actions, then after taking corrective actions, DTE Electric will provide a written notification to the Project Developer. A site visit will be scheduled after all corrective actions are taken.

11. DTE Electric will inspect the project and witness or perform commissioning tests on the Protective Equipment, Settings, Communications and Configuration. Project Developer shall be responsible for any cost to test Project Developer protective equipment and any additional costs to complete the Interconnection Request. Any inspection provided by DTE Electric is for the purpose of determining compliance with the technical provisions of DTE Electric's rules and regulations for service and is, in no way, a guarantee of methods or appliances used by Project Developer or for the safety of the Interconnection Project.

12. Project Developer shall enter into an Interconnection Agreement with DTE Electric in coordination with this Agreement. Project Developer shall not operate the Interconnection

project in parallel with DTE Electric, even for testing, until DTE has given Authorization to Operate in Parallel.

13. Any sales of electric energy or renewable energy credits from the Interconnection Project to DTE Electric or a third party, if applicable, are subject to the execution and delivery of a separate agreement.

14. Within twenty (20) business days of providing Authorization of Parallel Operation, DTE Electric will provide Project Developer the Actual Costs incurred to complete Distribution System Upgrades and commission the Interconnection Project. DTE Electric will reconcile the Estimated Costs received from Project Developer upon execution of this Agreement with the Actual Costs incurred by DTE Electric. If the Actual Costs exceed the Estimated Costs, Project Developer shall pay the difference within twenty (20) business days from the invoice date. If the Estimated Costs are more than the Actual Costs, DTE Electric shall refund the difference within twenty (20) business days of the date of the invoice or the date of reconciliation, whichever is later.

15. Except as set forth in Section 16 below, as between the Parties, unless caused by the sole negligence or intentional wrongdoing of the other Party, each Party to this Agreement shall at all times assume all liability for, any and all damages, losses, claims, demands, suits, recoveries, costs, legal fees, and expenses to the extent caused by its directors, officers, employees, and agents: (a) for injury to or death of any person or persons whomsoever occurring on its own system, and/or (b) for any loss, destruction of or damage to any property of third persons, firms, corporations or other entities occurring on its own system, including environmental harm or damage arising out of or resulting from, either directly or indirectly, the Interconnection Facilities or the DER, or arising out of or resulting from, either directly or indirectly, any electric energy furnished to it hereunder after such energy has been delivered to it by such other Party. The provisions of this Section 15 shall not be construed to relieve any insurer of its obligations to pay any insurance claims in accordance with the provisions of any valid insurance policy.

Notwithstanding anything in this Section, or any other provision of this Agreement to the contrary, any liability of a Party to the other Party shall be limited to direct actual damages, and all other damages at law or in equity are hereby waived. Under no circumstances shall a Party be liable to the other Party, whether in tort, contract or other basis in law or equity for any special, indirect, punitive, exemplary or consequential damages, including lost profits.

The obligations and limits on liability in this Section 15 shall continue in full force and effect notwithstanding the expiration or termination of this Agreement, with respect to any event or condition giving rise to an obligation that occurred prior to such expiration or termination.

Nothing in this Section 15 waives or limits, or shall be construed to waive or limit, the governmental immunity of a Party.

Nothing in this Section 15 shall imply, or be construed to imply, indemnification of any Party by the State of Michigan, its department, and agencies, or by other governmental customers that are restricted from entering into indemnification provisions by law.”

16. NEITHER DTE ELECTRIC NOR PROJECT DEVELOPER SHALL BE LIABLE HEREUNDER FOR ANY SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING LOSS OF BUSINESS OR PROFITS, WHETHER BASED UPON BREACH OF WARRANTY, BREACH OF CONTRACT, NEGLIGENCE, STRICT LIABILITY, TORT OR ANY OTHER LEGAL THEORY, AND WHETHER OR NOT DTE ELECTRIC OR PROJECT DEVELOPER HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

17. Any notice or request made to or by either party regarding this Agreement shall be made to the representative of the other party, or its designated agent, as indicated below.

18. This Agreement is the complete agreement of DTE Electric and Project Developer concerning the subject matter hereof and supersedes any prior or contemporaneous agreements or understandings whether oral or written.

19. This Agreement shall not confer any rights or remedies upon any person other than the Parties and their respective successors and permitted assigns.

20. This Agreement shall be binding upon and inure to the benefit of the Parties named herein and their respective successors and permitted assigns. Project Developer may not assign either this Agreement or any of its rights, interests, or obligations hereunder without the prior written approval of DTE Electric. Any assignment by Project Developer without the prior written approval of DTE Electric is null and void.

21. The parties agree that DTE Electric shall perform hereunder in the capacity of an independent contractor. Nothing in this Agreement shall be construed to mean or imply that DTE Electric is a partner, joint venturer, agent or representative of, or otherwise associated with Project Developer.

22. This Agreement shall be governed by and construed in accordance with the laws of the State of Michigan without giving effect to any choice or conflict of law provision or rule (whether of the State of Michigan or any other jurisdiction) that would cause the application of the laws of any jurisdiction other than the State of Michigan.

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed by their respective authorized officials.

DTE Electric

Project Developer

\_\_\_\_\_  
(signature)

\_\_\_\_\_  
(signature)

\_\_\_\_\_  
(Typewritten or Printed Name)

\_\_\_\_\_  
(Typewritten or Printed Name)

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

\_\_\_\_\_  
Date

## EXAMPLE SCOPE

### Appendix A: Scope and Estimate

#### Industrial/Generation Relaying:

To meet the Level # requirements, both an interconnection protective relay must be used and an anti-islanding scheme must be provided.

The relay must be selected from our approved list of relays for interconnection protection, though a SEL 751 is recommended. It must provide three phase over/under voltage and over/under frequency protection for the installation and be separate from dedicated generator protection relays. The relay must have dc power from a separate reliable source; such as a battery or UPS. DTE Electric Relay Engineering will develop the settings for the functions described above.

The customer will be responsible for the purchase, installation, calibration and testing of this new relay and any desired backup relays.

This relay must trip a device open, thus breaking parallel operation of the generators with the DTE Electric system, for adverse conditions or relay failure. It is at the customer's discretion which device they intend to trip.

Anti-islanding protection must be provided, as required from XXXX to XXXX and from XXXX to XXXX

Provision of Communications modules at each location; XXXX, XXXX and XXXX.

These devices will communicate over either a fiber, microwave, radio or Ethernet private communications network.

Customer will install all equipment at the customer owned XXXX end, including all tie ins and conduit routing.

The customer must provide DTE with drawings showing the new relay installation; including One lines, three-lines and schematics to show the complete end to end installation including trips.

These drawings must be approved, prior to any construction. Customer must closely coordinate with DTE for the installation of the DTE equipment required for anti-islanding protection, network communications and SCADA.

An on-site witness test by DTE technicians will need to be accomplished, prior to final operation to ensure protection operates as designed.

Customer will be responsible for configuring the connection to the DTE Interconnection Gateway on site as per DTE provided standards and point mappings

DTE will provide an indoor enclosure containing the following equipment:

DTE Electric: Interconnection Agreement: Attachment A: Construction Agreement

XXXXXX

Developer will then be responsible to install this enclosure and to provide all auxiliary power, control and communication connections to this enclosure, including connections to the new communications enclosure.

Note: the trip connection must be installed in parallel to the existing trip locations and the old transfer trip scheme can NOT be decommissioned until the new scheme has been installed and fully tested, if applicable. Upon completion of installation of both this box at the customer location and the work at XXXXXX and XXXX, DTE Personnel will work with XXXXXX to supervise, troubleshoot and commission the new transfer trip scheme.

### SCADA:

A DTE SCADA technician will need to visit the site to configure communications and point configurations in the RTU, terminate any new data points, and check in locally and with SOC. For this location where SCADA communications with SOC will be via IP based communications through a medium selected from the telecommunications section below.

Estimated Cost for equipment and configuration at XXXXXX site = \$\$\$\$\$

### Substations:

DTE Substation Work:

DTE will remove XXXXXX and install XXXXXXX at XXXXXX and XXXX. DTE will test equipment and commission at XXXXXX and XXX.

Estimated Cost for the above DTE Substation work = \$\$\$\$\$.

### Telecommunication

DTE will install and configure one of the following options

- Option 1: Interconnect XXXX to XXXX via XXXXX. ~## mi @ \$\$\$k per mile in accordance with DTE Communications Design.

Cost of Option 1: \$\$\$\$

- Option 2: Install XXXXXXX. Customer coordination to locate XXXX at XXXXX site will be required.

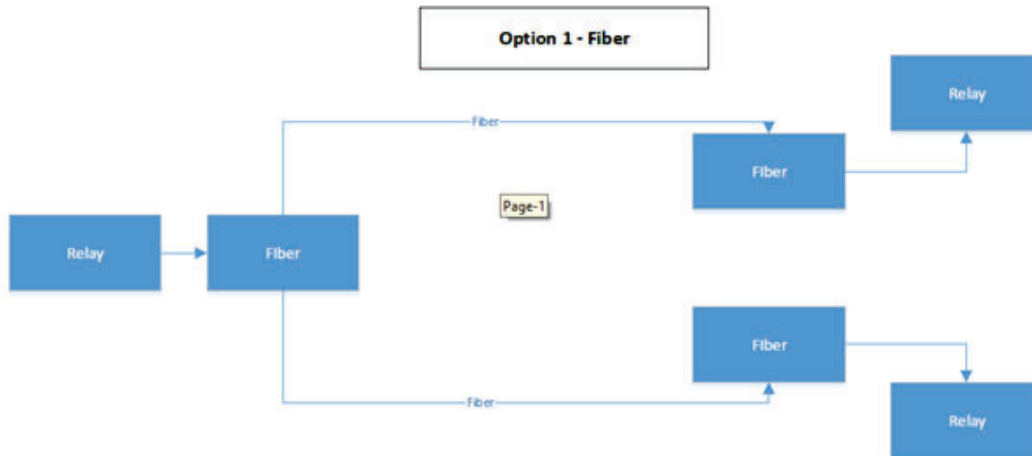
Cost of Option 2: \$\$\$\$ plus \$\$/year O&M for XXXXXX

**Total Project Estimate:**

**Option 1: (Description) \$\$\$\$K**

**Option 2: (Description) \$\$\$\$K**

**Communication Diagram: EXAMPLE**



**Primary Services / Pert / Commissioning:**

Site visits, Functional Testing verifications, and Commission Testing with DTE field service personnel will need to be coordinated.

## Additional Configuration, Communications, Protection Settings:

27 - x2  
59 - x2  
32 - x1  
81o - x1  
81u - x1

### Undervoltage Elements

#### **27 element (3 phase)**

Pick Up =  $0.88 \times V_{nm}$

Delay = 2000 ms or 2s

This is intending to trip when export voltage falls below 88% Nominal Voltage  
Per IEEE 1547 Section 4.2.3

#### **27 element (3 phase)**

Pick Up =  $0.5 \times V_{nm}$

Delay = 167 ms or 10 cycles

This is intending to trip when export voltage falls below 50% Nominal Voltage  
Per IEEE 1547 Section 4.2.3

### Overvoltage Elements

#### **59 element (3 phase)**

Pickup =  $1.1 \times V_{nm}$

Delay = 1000 ms or 1s

This is intending to trip when export voltage rises above 110% Nominal Voltage  
Per IEEE 1547 Section 4.2.3

#### **59 element (3 phase)**

Pickup =  $1.2 \times V_{nm}$

Delay = 167 ms or 10 cycles

This is intending to trip when export voltage rises above 120% Nominal Voltage  
Per IEEE 1547 Section 4.2.3

### Under Frequency

#### **81 element (3 phase)**

Pickup = 57

Delay = 167 ms or 10 cycles

This is intending to trip when export frequency drops below 57 Hz  
Per IEEE 1547 Section 4.2.4

### Over Frequency

#### **81 element (3 phase)**

Pickup = 60.5

Delay = 167 ms or 10 cycles

This is intending to trip when export frequency rises above 60.5 Hz  
Per IEEE 1547 Section 4.2.4

**Additional Notes:**

The trip actuation should include the power element, all over/undervoltage elements, all over/under frequency elements and RELAY FAIL with a logical OR for all of the elements.

Customer should consider the use of an inhibit input for the trip. This could be based on a generator running signal or on the position of the isolating 52 Breaker's. This would disable the protection in the event that the generator is not in use. **\*\*THIS IS NOT A REQUIREMENT, BUT A RECOMMENDATION. \*\***

All other elements may be set freely by customer for their needs. Please forward a copy of the final settings file for the relay after programming, testing, and verification is complete.

DTE requires trips (27,32,59,81ou) shall be programmed to one dedicated Trip OUTPUT with a note stating that "DTE Required Output for Limited Sell Back"

## Appendix B: Project Schedule

Interconnection Project:

DE-####/DE-#### – XXXXXXXXXXXX

### Project Schedule:

All activities will begin after the Fully Executed Construction Agreement and all monies have been received.

## (XXXX) months estimated

Coordination required with Affected systems that may affect schedule:

Operation and coordination with ITC at shared station sites

SCADA – Approximately ## months from receipt of order per the manufacturer. This time includes XXXXXX

Telecom – ## months to design and build XXXXXX.

Substation Design - ## months to XXXXXX.

This estimate timeline will be updated at the completion of design activities.

Commissioning timeline will be dependent on required shutdowns at each site and the coordination required to complete the work. Coordination with customer site will be required for final commissioning and will be scheduled at a mutually agreed upon time after construction completion.

Total time line is ## months following receipt of payment.

XXXXXXXX, (Project Developer), and The DTE Electric Company, as required by the DTE Electric [Project] Construction Agreement for Generator Interconnection To DTE Electric's Distribution System dated MM/DD/YYYY agree to the above stated Project Schedule for the Interconnection Project.

GENERATOR INTERCONNECTION & OPERATING AGREEMENT  
FOR LEVEL 4 – 5 PROJECTS  
WITH AGGREGATE GENERATOR OUTPUT OF GREATER THAN 150 kW OR NON-CERTIFIED  
PROJECTS OF ANY SIZE  
BETWEEN DTE ELECTRIC COMPANY  
AND  
(PROJECT DEVELOPER NAME) (DE-####)

GENERATOR INTERCONNECTION & OPERATING AGREEMENT (hereinafter, this Agreement), is made and entered into on (MM/DD/YYYY), (hereinafter, the Effective Date), between DTE ELECTRIC COMPANY, a Michigan corporation, with offices located at One Energy Plaza, Detroit, MI 48226, herein termed "DTE", and (Project Developer Name) with offices located at (Address, City, State, ZIP), herein termed "Project Developer." DTE and Project Developer are hereinafter sometimes referred to individually as "Party" and collectively as "Parties" where appropriate.

WITNESSETH:

WHEREAS, DTE owns electric facilities and is engaged in the generation, purchase, distribution and sale of electric energy in the State of Michigan; and

WHEREAS, Project Developer intends to construct and own a \_\_\_\_\_ plant, known as the Generating Plant, herein termed "Project", with a generator design capacity nameplate rating not to exceed a ### kW / ### kVA with an export capacity of ### kW for a Level # project for a system of type \_\_\_\_\_ for a generator of type \_\_\_\_\_ and located at (Address, City, State, ZIP) with project number DE-#### assigned by DTE Electric on MM/DD/YYYY.; and

WHEREAS, This Agreement does not address the sale of electricity to or from DTE; and

WHEREAS, The Parties desire to enter into this Agreement for the purposes, among others, of (a) describing (i) the facilities and associated appurtenances to interconnect the Project to DTE's distribution system, including defining the Point of Delivery and Interconnection Point, (ii) the facilities required for providing and regulating reactive power supply (kilovars) at the Project, and (iii) any modifications and additions necessary on DTE's distribution system as a result of the operation of the Project; (b) establishing the ownership interests of DTE and Project Developer in such facilities; (c) establishing the respective obligations and rights of the Parties with respect to the procurement, construction, installation, operation and maintenance of such facilities.

NOW, THEREFORE, in consideration of the mutual covenants and agreements herein set forth, the Parties hereto agree as follows:

RECITALS

A. Applicant is an electric service customer of Utility in good standing and has submitted a Generator Interconnection Application (“Application”) to Utility.

B. Applicant desires to interconnect an electric generating facility with a maximum capacity of greater than 550 kW kilowatts (“kW”) (the “Applicant Facility”) or any Non-Certified system with Utility’s electric distribution system and operate Applicant Facility in parallel with Utility’s distribution system, under the Utility’s Interconnection Procedures for Level 4 or 5 projects, as defined in the Electric Interconnection Standards approved by the Commission (the “Standards”), as applicable.

C. For purposes of this Agreement, “interconnect” means establishing a connection between a non-utility generating and/or storage resource (in this case, the “Applicant Facility”) and Utility’s distribution system. “Operate in parallel” means generating or dispatching electricity from a non-utility resource (in this case, the Applicant Facility) that is connected to Utility’s system. In all cases, terms shall have the meaning as defined in the Standards.

D. Interconnection of the Applicant Facility with Utility’s distribution system is subject to this Agreement, the Application, the Interconnection Procedures, the Standards and utility tariffs approved by the MPSC, as applicable. Interconnection of the Applicant Facility is also subject to local, county and state requirements for applicable permits, inspections and other requirements.

SECTION 1  
INTERCONNECTION FACILITIES

1.1 General

The Parties shall provide, as specified in this Section 1, certain facilities and associated appurtenances required to interconnect the Project to DTE’s distribution system, consistent with the Michigan Electric Utility Generator Interconnection Requirements. Such facilities and associated appurtenances include, but shall not be limited to, interconnection, transformation, switching, control, metering, telemetering, protective relaying equipment (such protective relaying equipment required by DTE or Project Developer to protect DTE’s distribution system, its customers, and the Project from electrical faults occurring at the Project or on DTE’s distribution system or on the systems of others to which DTE’s distribution system is directly or indirectly connected), power quality equipment, and any necessary additions or reinforcements by DTE to DTE’s distribution system required as a result of the interconnection of the Project to DTE’s distribution system. The facilities and associated appurtenances described in Exhibit 1 – Scope of Facilities, Subsections 1.2, "Project Developer's Interconnection Facilities," and 1.3, "DTE’s Interconnection Facilities," are hereinafter sometimes referred to as the "Interconnection Facilities." Project Developer shall be responsible for the cost of the Interconnection Facilities, unless otherwise specified in this Agreement.

The Applicant Facility must be built with the following ratings, which shall not be changed without advance written notice of a material modification to the Utility and Utility Approval and according to the notice requirements herein and as depicted in Exhibit 1 – Interconnection Diagram and subject to any Utility required communications requirements, configuration and/or protection settings:

Approved System Output:	{data: Approved Capacity field 2}	(AC) kW
Total DC Nameplate Output:	{data: DC Total Nameplate}	(DC) kW
Total AC Nameplate Output:	{data: AC Total Nameplate}	(AC) kW
Inverter Power Limited Output/Export Capacity:	{data: Inverter Power Limited Output Formula field}	(AC) kW
Photovoltaic/Solar (“PV”) Array Rating:	{data: PV System Nameplate Rating}	(DC) kW
Photovoltaic/Solar (“PV”) CEC Rating:	{data: PV System CEC Rating}	(AC) kW
Wind Turbine (WT) Rating:	{data: "System Rating, Wind field"}	(AC) kW
Hydroelectric Turbine (HT) Rating:	0	(AC) kW
Fuel Cell (FC) Rating:	{data: "System Rating, Fuel Cell field"}	(AC) kW
Other (specify type and rating):	{data: "System Rating, Other field"}	(AC) kW
Storage System DC Output:	{data: Storage System DC Rating field}	(DC) kW

Storage System AC Output: {data: Storage Inverter AC Capacity (AC) kW  
field}  
Stored Energy: {data: Stored Energy (kWh)} kWh  
Storage System Modes: {data: Storage Backup AND Export  
field}

Service Type: {data: Wiring Configuration}  
Voltage Level: {data: Generator AC Output Voltage}  
Equipment Specifications:

PV System: {pv\_system\_equipment: PV System, minimal} {data: Generator Type Describe-Combo} {data: Generator Type Describe-Other}  
Solar & Storage System Inverters: {data: Are solar and storage system connected behind a single inverter or separate inverters}  
Battery: {data: Energy Storage System Quantity (units)} {data: Energy Storage System Manufacturer} {data: Energy Storage System Model} {data: Energy Storage System Model} 2}  
Inverter: {data: Storage System Inverter Quantity} {data: Storage System Inverter Manufacturer} {data: Storage System Inverter Model}

Applicant Facility Location:

{address\_multiline: Physical Site Service Address}

If Applicant is not the owner of the property identified above, the Property Owner must sign this Agreement for the purposes indicated in Paragraph 5.

Applicant's Utility service account number: \_{data: DTE Service Account}\_

Property Owner's Utility service account number (if applicable): \_\_\_\_\_

The Applicant Facility is planned to be ready for parallel operation on or about: \_{data: Proposed/Requested In-Service Date}\_

If it is necessary for Utility to install certain interconnection facilities ("Interconnection Facilities") and make certain system modifications in order to establish an interconnection between the Applicant Facility and Utility's distribution system, the Interconnection Facilities and modifications and the costs to the Applicant shall be described in the Construction Agreement Attachment "A" which is agreed to as a condition of signing this Interconnection Agreement.

The Project, configured as discussed in this Agreement and depicted in Exhibit 2 – Wiring Diagram, will be comprised of \_\_\_\_\_ generators with a total generation output of {data: AC Total Nameplate} , which can be connected to DTE's distribution system as described herein. In the future, if the Project Developer desires to install additional generating units at this present location, the Project Developer must submit a new application to DTE. DTE will evaluate its distribution system to determine, in its sole discretion, if conditions at that time will allow said system to support additional capacity.

In the event future changes in (a) the design or operation of the Project, (b) Federal, State or local laws, regulations, ordinances or codes, (c) Project Developer's requirements (such as additional generators located at the site location identified above) or (d) DTE's requirements necessitate additional facilities or modifications to the then existing Interconnection Facilities, the Parties shall undertake such additions or modifications as may be necessary. Before undertaking such future additions or modifications, the Parties shall consult, develop plans and coordinate schedules of activities so as to minimize disruption of the Interconnection Facilities and DTE's distribution system. The cost of such future additions or modifications to the Interconnection Facilities shall be borne by the Project Developer, unless agreed upon otherwise at the time. The ownership, operation and maintenance responsibilities for any such future additions or modifications shall be made consistent with the responsibilities allocated in this Agreement.

### 1.2 Project Developer's Interconnection Facilities

Project Developer's Interconnection Facilities and associated appurtenances are described in Subsection 1.2 of Exhibit 1 – Scope of Facilities.

Project Developer shall bear the cost of its Project unless otherwise specified in this Agreement. Project Developer shall be solely responsible for all permits, zoning reviews, and other matters associated with obtaining rights from any governmental body or agency to construct its Project. Developer shall be responsible for obtaining any rights of way, per DTE specifications, that are needed by either party to construct interconnection facilities and will transfer right of way to DTE for required interconnection facilities. Prior to DTE beginning construction of its Interconnection Facilities, Project Developer shall provide a copy of all necessary documents granting Project Developer the right to construct its Project.

### 1.3 DTE's Interconnection Facilities

DTE's Interconnection Facilities and associated appurtenances are described in Subsection 1.3 of Exhibit 1 – Scope of Facilities.

Project Developer shall bear the cost of DTE's Interconnection Facilities unless otherwise specified in this Agreement. DTE shall be responsible for all permits, zoning reviews, and other matters associated with obtaining rights from any governmental body or agency to construct its Interconnection Facilities. Project Developer shall reimburse DTE for all costs associated with the installation and connection of DTE's Interconnection Facilities. Project Developer shall solely assume the risk that DTE may be unable to complete its Interconnection Facilities due to factors beyond its reasonable control.

### 1.4 Easements and Permits

If necessary, prior to the installation of the Interconnection Facilities, Project Developer will acquire required permits and necessary easements for DTE Interconnection Facilities as per DTE specifications. These easements / permits may include, but shall not be limited to, rights of ingress and egress, rights to clear trees, and all necessary rights-of-way for installation and maintenance of Interconnection Facilities. The project developer shall transfer required easements and rights of way to DTE. The Project Developer shall reimburse DTE for the costs and expenses DTE incurs in acquiring easements and permits.

### 1.5 Relocation by Project Developer

If at any time the Project Developer requires DTE's Interconnection Facilities located on its premises to be relocated on such premises, DTE shall, at Project Developer's expense and upon its request, relocate the same or give permission for Project Developer to relocate the same. Project Developer shall provide DTE with all necessary easement rights as required for the Interconnection Facilities located on Project Developer's premises.

SECTION 2  
DESIGN AND CONSTRUCTION OF THE INTERCONNECTION FACILITIES

2.1 Authority for Construction

Except as provided in the following paragraph, Project Developer will have sole authority to manage, design, supervise, construct, procure materials for, control and will take all steps which it deems necessary or appropriate for the installation of the Interconnection Facilities required pursuant to Subsection 1.2, "Project Developer's Interconnection Facilities."

The design, specifications, installation and construction of the Interconnection Facilities required pursuant to Subsection 1.2 shall be in accordance with standards no less stringent than those used by DTE for its own distribution voltage level installations and shall be inspected and commented on by DTE prior to being placed into initial operation. However, DTE has no liability, obligation or responsibility with respect to such design, plans, specifications, installation or construction regardless of its inspection and comment thereon. Inspection of and comments by DTE shall not relieve Project Developer of any of its obligations under this Agreement.

DTE shall exercise sole authority to manage, design, supervise, construct, procure materials for, control and take all steps which it deems necessary or appropriate for the installation and connection of the Interconnection Facilities required pursuant to Subsection 1.3, "DTE's Interconnection Facilities."

2.2 Interconnection of the Project

Interconnection of the Project to DTE's distribution system shall be made after the following conditions have been satisfied:

- 2.2.1 Both Parties have declared their Interconnection Facilities ready for service and all items in Attachment A are complete;
- 2.2.2 Project Developer has met the design, specifications, installation and construction requirements of the second paragraph of Subsection 2.1, Authority for Construction;
- 2.2.3 Project Developer has provided adequate protective and power quality equipment to protect the equipment and service of DTE from damage or interruption from electrical faults occurring at the Project;
- 2.2.4 DTE has installed, tested and accepted the billing meters and associated telemetry for the collection of the metered data required pursuant to Exhibit 1 – Scope of Facilities, Subsection 1.3;
- 2.2.5 Project Developer and DTE have agreed to a procedure to describe the process (i) for switching and tagging the interconnection facilities for workers' protection during periods when such equipment must be removed from service and (ii) for returning the equipment to service.
- 2.2.6 If the Project Developer requires backup power from DTE, the Project Developer shall be responsible for contracting with DTE for the delivery of said backup power. The Project Developer shall provide DTE satisfactory evidence that it has purchased the resources to supply backup power pursuant to Subsection 6.6, Project Backup Power; and
- 2.2.7 Project Developer has reimbursed DTE for all costs associated with the installation of DTE's Interconnection Facilities as identified in Subsection 1.3 and 1.4.
- 2.2.8 DTE Electric has accepted and reviewed any inspection documents, configuration documents, test reports and has either conducted a witness test or waived its right to do so.
- 2.2.9 DTE Electric has provided an Authorization of Parallel operation to the project

2.3 Parallel Operation of the Project With DTE's Distribution System

Parallel operation of the Project with DTE's distribution system shall only begin after the following conditions have been satisfied and confirmed in writing by DTE to Project Developer:

- 2.3.1 Project Developer has met all of the requirements of Subsection 2.2;
- 2.3.2 Project Developer has obtained written approval by DTE of all protective relay equipment required pursuant to Exhibit 1 – Scope of Facilities, Subsection 1.2 and the direct transfer trip equipment required pursuant to Subsections 1.2 and 1.3 for the protection of DTE's distribution system. Approval will be granted after the required protective relay equipment is inspected and calibrated in accordance with the relay setting data issued by DTE. Inspection and calibration must be either performed or witnessed by DTE's personnel at Project Developer's expense. Project Developer must record the actual settings and inspection data on the relay-setting document furnished by DTE and return such document to DTE for approval;
- 2.3.3 Project Developer has developed operating and maintenance procedures, including software update and cybersecurity procedures, which DTE has accepted in writing, for those protective devices which directly connect to DTE's distribution system or interface with DTE's protective devices;
- 2.3.4 DTE has tested and accepted the telemetry / SCADA interface and concurs they meet the technical requirements as identified in the Telemetry and Disturbance Monitoring Requirements Section and the Communication Circuits

Section of the Michigan Electric Utility Generator Interconnection Requirements. Testing must be performed by DTE's personnel at Project Developer's expense and acceptance will be communicated to Project Developer in writing; and

2.3.5 Project Developer has developed operating procedures to manually trip generation for system security pursuant to Subsection 6.4, System Security.

2.3.6 The Project Developer has completed commissioning testing witnessed by DTE, accepted in writing.

#### 2.4 Subcontractors

Either Party may hire a subcontractor to perform its obligations under this Agreement and shall incorporate the obligations of this Agreement into its respective subcontracts, agreements and purchase orders. Each Party shall remain liable to the other Party for the performance of such subcontractor under this Agreement and shall fully defend, indemnify and hold the other Party harmless from all acts or omissions of its subcontractors.

SECTION 3  
OPERATION AND MAINTENANCE

3.1 Operation and Maintenance By DTE

DTE shall have sole authority and responsibility to operate and maintain DTE's Interconnection Facilities required pursuant to Subsection 1.3, and in accordance with the applicable good utility practice standards of DTE. DTE may manually operate, when necessary, DTE's Interconnection Facilities and the isolation device provided by Project Developer pursuant to Exhibit 1 – Scope of Facilities, Subsection 1.2, and may perform preventive or emergency maintenance, or make system modifications, when necessary, on DTE's Interconnection Facilities. Normal maintenance shall be scheduled on DTE's Interconnection Facilities taking into consideration Project Developer's schedule of maintenance for the Project. Such authority and responsibility shall include removing the Interconnection Facilities from service, when necessary, as determined by DTE. DTE shall not be required to deliver energy to the Project or provide a temporary connection to the Project when maintenance or system modifications require disconnecting DTE's Interconnection Facilities from DTE's distribution system.

3.1.1 Project Developer shall reimburse DTE for all direct and indirect costs and expenses (including but not limited to, overtime pay, property taxes, insurance, equipment testing and inspections) incurred by DTE in owning, operating and maintaining DTE's Interconnection Facilities from the point in time in which DTE's Interconnection Facilities are ready for service. Such costs and expenses shall be determined by DTE in accordance with the standard practices and policies followed by DTE and in effect at the time such operation and maintenance is performed. As used in this Agreement, the term "maintenance" includes inspection, repair and replacement. Payment by Project Developer of such costs and expenses shall be made in accordance with Subsection 3.1.4. In the event that DTE uses any part of DTE's Interconnection Facilities defined in Subsection 1.3 for the benefit of DTE's customers, then the allocation of the ongoing costs and expenses which are due to the ownership, operation and maintenance of DTE's Interconnection Facilities provided pursuant to Subsection 1.3, shall be re-determined with consideration for possible changes in: (a) Point of Delivery, (b) metering location, (c) operation and maintenance costs to Project Developer to new Point of Delivery, if any, and (d) compensation to DTE for appropriate operating and maintenance costs from the new Point of Delivery, if any. DTE shall not be restricted in the use of DTE's Interconnection Facilities while such redetermination is being made.

3.1.2 If DTE performs the following tasks on the Project Developer's behalf, the Project Developer shall reimburse DTE for costs associated with (a) testing of metering and associated telemetry required pursuant to Subsection 2.2.4, (b) the relay setting information, inspection and calibration required pursuant to Subsection 2.3.2 and (c) the testing of the dispatching interface required pursuant to Subsection 2.3.4, which shall be separately billed by DTE.

3.1.3 Project Developer shall be solely responsible for ordering, acquiring and all continuing operating expenses associated with the voice and data communication provisioning pursuant Exhibit 1 – Scope of Facilities, Subsection 1.2 as well as the proper safety equipment required for the proper installation of said provisioning. Additional operation and maintenance expenses associated with telemetry facilities are the responsibility of the Project Developer pursuant to Subsection 5.4.

3.1.4 Payments by Project Developer of the costs and expenses described in Subsections 3.1.1 and 3.1.2 are as follows:

3.1.4.1 As soon as practicable after the end of each month in which operation and maintenance costs and expenses were incurred by DTE pursuant to Subsection 3.1.1 and 3.1.2, DTE shall furnish Project Developer a statement describing the work performed or expense incurred and showing the amount of the payment to be made therefore by Project Developer.

3.1.4.2 Each statement shall be paid by Project Developer so that DTE will receive the funds by the 20th day following the date of such statement, or the first business day thereafter if the payment date falls on a non-business day.

3.1.4.3 All payments shall be made payable to [DTE Electric Company](#) and shall be sent to DTE, Attention: [DTE Electric Company, One Energy Plaza, Detroit, MI 48226](#) or by wire transfer to a DTE's bank account or such other manner or at such place as DTE shall, from time to time, designate by written notice to Project Developer. Payments made by wire transfer shall reference the appropriate invoice number for which payment is being made.

3.1.4.4 Any payment not made on or before the due date shall bear interest, from the date due until the date upon which payment is made, at an annual percentage rate of interest equal to the lesser of (a) the prime rate published by the Wall Street Journal (which represents the base rate on corporate loans posted by at least 75% of the nation's banks) on the date due, plus 2%, or (b) the highest rate permitted by law.

### 3.2 Operation and Maintenance By Project Developer

3.2.1 Except as provided in Subsections 2.3.2 and 3.1 and the provisions of this Subsection 3.2, Project Developer shall have sole authority and responsibility to operate and maintain the Project Developer's Interconnection Facilities required pursuant to Subsection 1.2 in accordance with prudent industry practices.

Relay settings, for protective devices required by DTE, may be revised and documents stating such revisions may be issued by DTE if it determines that it is necessary to do so. The settings for these devices may be revised only if DTE issues documents specifying such revisions. In such event, the protective relay equipment shall be recalibrated by Project Developer in accordance with such revised relay settings within a reasonable period specified by DTE. The procedure for recalibration and approval shall be the same as stated for the initial calibration pursuant to Subsection 2.3.2.

The protective relay and power quality equipment shall be tested every two (2) years (unless an extension is agreed to by DTE) to verify the calibration indicated on the latest relay setting document issued by DTE. If the protective relay equipment is not calibrated in accordance with the latest relay-setting document, it shall be recalibrated in accordance with Subsection 2.3.2, to conform with such data. Tests shall be conducted or witnessed by DTE at Project Developer's expense. The results of such tests shall be provided to DTE in writing for review and approval.

DTE may, at any time in addition to that specified in the preceding paragraph, at DTE's expense, inspect and test Project Developer's Interconnection Facilities to verify that the required protective and power quality interconnection equipment is in service, properly maintained, and calibrated to provide the intended protection. If necessary, this inspection may also include a review of Project Developer's pertinent records.

Project Developer must notify prior to and provide in writing when Generator will be taken out of service and returned to service.

Inspection, testing and/or approval by DTE or the omission of any inspection, testing and/or approval by DTE pursuant to this Agreement shall not relieve Project Developer of any obligations or responsibility assumed under this Agreement.

3.2.2 Applicant shall be responsible for the design and installation of the Applicant Facility and obtaining and maintaining any required governmental authorizations and/or permits, which may include, but shall not be limited to, easements to clear trees, and necessary rights-of-way for installation and maintenance of the Utility Interconnection Facilities.

3.2.3 Applicant shall, at its sole expense, install and properly maintain protective relay equipment and devices to protect its equipment and service, and the equipment and system of Utility, from damage, injury or interruptions, and will assume any loss, liability or damage to the Applicant Facility caused by lack of or failure of such protection. Such protective equipment specifications and design shall be consistent with the applicable Interconnection Procedures.

Prior to the Applicant Facility operating in parallel with Utility distribution system, Applicant shall provide satisfactory evidence to Utility that it has met the Interconnection Procedures, including but not limited to the receipt of approval from the local building/electrical code inspector. The Utility's approval, or failure to approve, under this section shall in no way act as a waiver or otherwise relieve the Applicant of its obligations under this section.

3.2.4 At its own expense, Applicant shall perform operational testing at least five (5) days prior to the installation of any Interconnection Facilities by Utility or an earlier time mutually agreed to as described in the Construction Agreement in Attachment "A". Utility may, but is not required to, send qualified personnel to the Applicant Facility to inspect the facility and observe the testing. Upon completion of such testing and inspection, and prior to interconnection, Applicant shall provide Utility with a written report explaining all test results, including a copy of the generator commissioning test report. The Utility required commissioning testing and inspection checklist is in Attachment "B" of this agreement, additional site specific instructions may be described in the Construction Agreement Attachment "A".

As described in Attachment "A", Applicant shall install and provision communications equipment. at its own expense, as specified by Utility. The maintenance and operations of which is at the sole expense of the Applicant. The Applicant

acknowledges that initially Utility may not require communications be installed by Applicant, but that Utility retains the right to add this requirement at a future date, and that Applicant has the obligation under this agreement to comply. Applicant shall configure the communications system to Utility specification. The Applicant is responsible for maintaining the communications software as set forth by Utility. The Applicant shall install and maintain needed cyber and physical security as specified by Utility. Failure to meet these requirements will result in disconnecting the interconnection. Current requirements are provided in Exhibit 2 of this document

Applicant shall test protective relay equipment in accordance with manufacturer's specifications, unless no testing interval is provided, in which case testing shall occur every two years (unless an extension is agreed to by Utility) to verify the calibration indicated on the latest relay setting document issued by Utility. The results of such tests shall be provided to Utility upon request. Utility may, at any time and at its sole expense, inspect and test the Applicant Facility to verify that the required protective equipment is in service, properly maintained, and calibrated to provide the intended protection. This inspection may also include a review of Applicant's pertinent records. Inspection, testing and/or approval by Utility or the omission of any inspection, testing and/or approval by Utility pursuant to this Agreement shall not relieve the Applicant of any obligations or responsibility assumed under this Agreement.

3.2.5 Applicant shall operate and maintain the Applicant Facility in a safe and prudent manner and in conformance with all applicable laws and regulations. Applicant shall obtain or maintain any governmental authorizations and permits required for construction and operation of the Applicant Facility.

SECTION 4  
ACCESS

At its own expense, Applicant shall make the Applicant Facility site available to Utility. The site shall be free from hazards and shall be adequate for the operation and construction of the Interconnection Facilities. Utility, its agents and employees, shall have full right and authority of ingress and egress at all reasonable times on and across the property at which the Applicant Facility is located, for the purpose of installing, operating, maintaining, inspecting, replacing, repairing, and removing the Interconnection Facilities. The right of ingress and egress shall not unreasonably interfere with Applicant's or (if different) Property Owner's use of the property and does not include the right to enter applicant's residence or other enclosed structure on the property where the Applicant Facility is located, except on reasonable notice where the Interconnection Facilities are located within the residence or other enclosed structure.

Utility may enter the property on which the Applicant Facility is located to inspect, at reasonable hours, Applicant's protective devices and read or test meters. Utility will use reasonable efforts to provide Applicant or Property Owner, if applicable, at least 24 hours' notice prior to entering said property, in order to afford Applicant or Property Owner the opportunity to remove any locks or other encumbrances to entry; provided, however, that Utility may enter the property without notice (removing, at Applicant's expense, any lock or other encumbrance to entry) and disconnect the Interconnection Facilities if Utility believes that disconnection is necessary to address a hazardous condition and/or to protect persons, Utility's facilities, or the property of others from damage or interference caused by Applicant Facility.

By executing this Agreement, Applicant and Property Owner consent to and agree to provide access to its property, including all rights of ingress and egress, on which the Applicant Facility is located to Utility as described in this section, but does not assume or guarantee other performance obligations of the Applicant under this Agreement.

DTE, its agents and employees, shall have full right and authority of ingress and egress at all reasonable times on and across the premises of Project Developer for the purpose of installing, operating, maintaining, inspecting, replacing, repairing, and removing its Interconnection Facilities located on the premises. The right of ingress and egress, however, shall not unreasonably interfere with Project Developer's use of its premises.

SECTION 5  
INTERCONNECTION POINT; POINT OF DELIVERY; METERING; TELEMETERING

5.1 Interconnection Point

The Interconnection Point shall be where the Project Developer's Interconnection Facilities connect to DTE's distribution system.

5.2 Point of Delivery

If the Project is connected to a distribution line serving other customers, the Point of Delivery shall be at the high voltage side of the Project supplied isolation transformer connecting the Project to DTE's distribution system. Otherwise, the Point of Delivery shall be the point at which the radial line connecting the Project to DTE's distribution system terminates at the first substation beyond the Project's isolation transformer.

5.3 Metering

Measurements of electric energy deliveries shall be made by standard types of electric meters installed and maintained by DTE pursuant to Exhibit 1 – Scope of Facilities, Subsection 1.3.

The standard electric meters shall be tested by DTE at least once every six (6) years. On request and at the expense of the Project Developer, a special test may be performed. Representatives of Project Developer shall be afforded the opportunity to be present at all routine or special tests and upon occasions when any readings, for purposes of settlements, are taken from meters not bearing an automatic record.

DTE may choose to replace a meter at any time and will notify the Project Developer prior to doing so.

#### 5.4 Telemetry

Certain telemetry facilities will be provided by DTE pursuant to Exhibit 1 – Scope of Facilities, Subsection 1.3 as a part of the Interconnection Facilities as being necessary for the proper and efficient collection of metering and control data. The cost and maintenance of such telemetry facilities and associated phone lines shall be borne by Project Developer.

SECTION 6  
SERVICE CONDITIONS

6.1 Site Preparation

At its own expense, the Project Developer shall make the proposed Project site available to DTE. Said site shall be free from hazard and shall be adequate for the operation and construction of distribution facilities necessary to interconnect the proposed Project. Site preparation shall include but not be limited to proper driveways, parking areas and walking paths.

6.2 Parallel Operation

It is understood that the Project will normally remain connected to and be operated in parallel with DTE's distribution system. The Project Developer shall, at its expense, install and properly maintain protective equipment and devices and provide sufficiently trained personnel to protect its equipment and service, and the equipment and service of DTE from damage, injury or interruptions during the Project's parallel operation with DTE's distribution system, and, without limiting the indemnity provided in Subsection 7.1 herein, Project Developer shall assume any loss, liability or damage to Project Developer and DTE's distribution system and equipment caused by lack of or failure of such protection. Such protective equipment specifications and design shall be consistent with the Michigan Electric Utility Industry Generator Interconnection Requirements, and any successor and/or supplemental documents. Prior to the Project operating in parallel with DTE's distribution system, the Project Developer shall provide satisfactory evidence to DTE that it has met the Michigan Electric Utility Generator Interconnection Requirements that are on file with the Michigan Public Service Commission and complied with all applicable laws, rules, regulations, guidelines, and safety standards.

6.3 Voltage Control and Power Quality

Project Developer shall cooperate with DTE to regulate the voltage level at the Point of Delivery by controlling its generators in accordance with DTE's instructions. Such instructions shall include, but not be limited to, (a) maintaining voltage or (b) delivering real and reactive power to the Point of Delivery at levels specified by DTE. (c) maintaining power quality and power quality equipment. The instructions given by DTE shall be consistent with the normal practices adhered to by DTE with respect to its own generators located on its system.

6.4 System Security

Installation, inspection, and calibration of relaying to trip generation for under- or over-frequency operation shall be coordinated with DTE, pursuant to Subsection 2.3.2, so as not to degrade the security of DTE's distribution system. Operating practices developed by Project Developer which call for manual tripping of generation for under-or over-frequency operation shall likewise be coordinated and be consistent with the provisions of East Central Area Reliability Document 3, "Emergency Procedures" During Declining System Frequency, and any successor and/or supplemental documents, which are incorporated herein by reference.

6.5 Continuity of Service

Each Party shall exercise reasonable care to maintain continuity of service in the delivery and receipt of electric energy. If service becomes interrupted for any reason, the cause of such interruption shall be removed and normal operating conditions restored as soon as practicable.

6.6 Project Backup Power

If the Project Developer requires backup power from DTE, the Project Developer will contract with DTE for the delivery of power provided to the Project under one of DTE's established retail rates set forth in DTE's tariffs, which are incorporated herein by reference. The provisions of such contract shall be applied during periods when the Project is not delivering energy to DTE. The Project Developer will contract with DTE for the purchase of energy or provide satisfactory evidence of the purchase of energy from an alternative energy supplier for the purpose of providing power to the Project during periods when the Project is not delivering energy to DTE's distribution system.

Project Developer shall have sufficient voltage regulation at the Project to maintain an acceptable voltage level for Project equipment during such periods when the Project's generation is off line.

6.7 DTE's Obligation to Connect

DTE shall not be obligated to continue the electrical interconnection to the Project if it determines, in its sole discretion, that any one or more of the following conditions exist, including but not limited to: (a) those conditions listed in the Miscellaneous Operational Requirements section of the Michigan Electric Utility Generator Interconnection Requirements, (b) electrical characteristics of the Project are not compatible with the electrical characteristics of DTE's distribution system, (c) the Project Developer is deficient in following either the voltage schedule or reactive power schedule established by DTE, (d) an emergency condition exists on DTE's distribution system, (e) Project Developer's protective relay equipment

fails, resulting in a lack of the level of protection required by prudent utility practice, (f) the Project Developer's Project is determined to be disrupting DTE customers, (g) DTE requires disconnection of the Project in order to construct, install, maintain, repair, replace, remove, investigate, inspect or test any part of DTE's Interconnection Facilities or any other DTE equipment associated with the interconnection (also if a required component (example: phone line) or required modification to allow interconnection fails or becomes incapacitated and is not repaired in a timely manner), (h) cyber security or physical security event (i) by mutual consent, (j) Project Developer commits a material breach of this agreement or (k) Project Developer's failure to execute this agreement or upon cancellation or termination of this agreement. DTE shall electrically connect or reconnect its distribution system to the Project when, in DTE's sole opinion, the conditions named above cease to exist. Under any of the conditions listed above, DTE will follow the procedures for disconnecting and re-connecting the interconnection as outlined in Appendix G of the appropriate Michigan Electric Utility Generator Interconnection Requirements document.

Utility shall be entitled to disconnect the Applicant Facility from Utility's distribution system, or otherwise refuse to connect the Applicant Facility, if: (a) Applicant has not complied with any one of the technical requirements contained in the applicable Interconnection Procedures, (b) the electrical characteristics, configuration, or communications of the Applicant Facility are not compatible with the electrical characteristics of Utility's distribution system, (c) an emergency condition exists on Utility's distribution system, (d) Applicant's protective relay equipment fails, (e) Utility determines that the Applicant Facility is disrupting service to any other Utility Customer, (f) disconnection is required to allow for construction, installation, maintenance, repair, replacement, removal, investigation, inspection or testing of any part of Utility's facilities, (g) if a required installation fails or becomes incapacitated and is not repaired in a timely manner, as determined by Utility, or (h) Applicant commits a material breach of this Agreement. (i) Operating in parallel without prior written authorization from the electric utility as provided for in Michigan Rule 460.968. (j) An electric utility may disconnect electric service, where applicable, pursuant to Michigan Rule 460.136. Failure of the interconnection customer to bring a DER into compliance pursuant to R 460.976(1). (k) Failure of the interconnection customer to pay costs of remedy pursuant to Michigan Rule 460.976

When reasonable and appropriate, the Utility will attempt to notify Applicant and coordinate its actions under this Paragraph with Applicant. This paragraph applies only to Utility actions with respect to Applicant Facility. Utility shall promptly re-connect the Applicant Facility to the Utility's distribution system as soon as the reason for disconnection has been remedied.

SECTION 7  
INDEMNITY; INSURANCE

7.1 Indemnity

7.1.1 Except as set forth in Section 3.2.3 and 6.2 above, as between the Parties, unless caused by the sole negligence or intentional wrongdoing of the other Party, each Party to this Agreement shall at all times assume all liability for, any and all damages, losses, claims, demands, suits, recoveries, costs, legal fees, and expenses to the extent caused by its directors, officers, employees, and agents: (a) for injury to or death of any person or persons whomsoever occurring on its own system, and/or (b) for any loss, destruction of or damage to any property of third persons, firms, corporations or other entities occurring on its own system, including environmental harm or damage arising out of or resulting from, either directly or indirectly, the Interconnection Facilities or the DER, or arising out of or resulting from, either directly or indirectly, any electric energy furnished to it hereunder after such energy has been delivered to it by such other Party. The provisions of this Section 7 shall not be construed to relieve any insurer of its obligations to pay any insurance claims in accordance with the provisions of any valid insurance policy.

7.1.2 Notwithstanding anything in this Section, or any other provision of this Agreement to the contrary, any liability of a Party to the other Party shall be limited to direct actual damages, and all other damages at law or in equity are hereby waived. Under no circumstances shall a Party be liable to the other Party, whether in tort, contract or other basis in law or equity for any special, indirect, punitive, exemplary or consequential damages, including lost profits.

7.1.3 The obligations and limits on liability in this Section 7 shall continue in full force and effect notwithstanding the expiration or termination of this Agreement, with respect to any event or condition giving rise to an obligation that occurred prior to such expiration or termination.

7.1.4 Nothing in this Section 7 waives or limits, or shall be construed to waive or limit, the governmental immunity of a Party.

7.1.5 Nothing in this Section 7 shall imply, or be construed to imply, indemnification of any Party by the State of Michigan, its department, and agencies, or by other governmental customers that are restricted from entering into indemnification provisions by law

7.2 Insurance

For level 3, 4, and 5 projects, the Applicant shall obtain and continuously maintain, as required in the applicable interconnection agreement, General Liability insurance written on a standard occurrence form, or other form acceptable to DTE, and covering bodily injury and property damage liability with a per occurrence and annual policy aggregate amount of at least:

Interconnection Level Minimum Limit

- Level 3 \$1,000,000
- Level 4 \$2,000,000
- Level 5 \$3,000,000

DTE shall be named as an additional insured under such policy. The policy shall be primary coverage with no contribution from any insurance maintained by DTE. DTE shall not be responsible for any unpaid premiums under Project Developer policy.

Evidence of insurance coverage on a certificate of insurance shall be provided to DTE upon execution of this Agreement and thereafter within ten (10) days after expiration of coverage; however, if evidence of insurance is not received by the 11th day, DTE has the right, but not the duty, to purchase the insurance coverage required under this Section and to charge the annual premium to Project Developer. DTE shall receive thirty (30) days advance written notice if the policy is cancelled or substantial changes are made that affect the additional insured. At DTE's request, Project Developer shall provide a copy of the policy to shall be mailed to:

Corporate Insurance Department, EP7-415  
DTE Electric Company  
One Energy Plaza  
Detroit, MI 48226

SECTION 8  
LIMITATION ON LIABILITY

Neither party shall in any event be liable to the other for any incidental or consequential damages such as, but not limited to, lost profits, revenue or good will, interest, loss by reason of shutdown or non-operation of equipment or machinery, increased expense of operation of equipment or machinery, cost of purchased or replacement power or services or claims by customers, whether such loss is based on contract, warranty, negligence, strict liability or otherwise, even if it has been advised of the possibility of such damages.

SECTION 9  
FORCE MAJEURE

Neither Party shall be liable for failure to perform any of its obligations hereunder, to the extent due to fire, flood, storm, other natural disaster, national emergency or war (referred to collectively as “Force Majeure”), and not due to labor problems, inability to obtain financing, negligence or other similar condition of such Party, provided that either Party has given the other prompt notice of such occurrence. The Party affected shall exercise due diligence to remove such Force Majeure with reasonable dispatch, but shall not be required to accede or agree to any provision not satisfactory to it in order to settle and terminate a strike or other labor disturbance.

SECTION 10  
DEFAULT

A default of this Agreement (“Default”) shall occur upon the failure of a Party to perform or observe any material term or condition of this Agreement, which includes, but is not limited to:

- a. Failure to pay money when due;
- b. Failure to comply with any material term or condition of this Agreement, including but not limited to any breach of any material representation, warranty or covenant made in this Agreement;
- c. A Party: (i) becomes insolvent; (ii) files a voluntary petition in bankruptcy under any provision of any federal or state bankruptcy law or shall consent to the filing of any bankruptcy or reorganization petition against it under any similar law; (iii) makes a general assignment for the benefit of its creditors or (iv) consents to the appointment of a receiver, trustee or liquidator;
- d. Assignment of this Agreement in a manner inconsistent with the terms of this Agreement;
- e. Failure of either Party to provide information or data to the other Party as required under this Agreement, provided the Party entitled to the information or data under this Agreement requires such information or data to satisfy its obligations under this Agreement.

In the event of a Default by either Party, the Parties shall continue to operate and maintain, as applicable, its Interconnection Facilities, protection and Metering Equipment, transformers, communication equipment, building facilities, software, documentation, structural components and other facilities and appurtenances that are reasonably necessary for DTE to operate and maintain DTE’s distribution system and for the Project Developer to operate and maintain its Project in a safe and reliable manner. Upon a Default, the non-defaulting Party shall give written notice of such Default to the defaulting Party. The defaulting Party then has 30 days to cure the Default. If a Default is not cured within the period provided for herein or as agreed to by the Parties, the non-defaulting Party shall have the right to terminate this Agreement and recover any damages and/or pursue any other remedies available under this Agreement, by law, or in equity. Termination is not the non-defaulting Party’s exclusive remedy and is in addition to any other rights and remedies it may have under this Agreement or by law. Failure of non-defaulting Party to exercise any of its rights under this Section shall not excuse defaulting Party from compliance with the provisions of this Agreement nor prejudice rights of DTE to recover damages for such default.

SECTION 11  
SUCCESSORS AND ASSIGNS

This Agreement shall inure to the benefit of and be binding upon the successors and assigns of the respective Parties hereto. This Agreement shall not be assigned, transferred or otherwise alienated without the other Party's prior written consent, which consent shall not unreasonably be withheld. Any attempted assignment, transfer or alienation without such written consent shall be void.

SECTION 12  
GOVERNING LAW

This Agreement shall be deemed to be a Michigan contract and shall be construed in accordance with and governed by the laws of Michigan, exclusive of its conflict of laws principles.

SECTION 13  
EFFECTIVE DATE, TERM AND TERMINATION

The Effective Date of this Agreement shall be the date of execution and shall continue in effect until this Agreement is terminated as provided herein. The Agreement may be terminated at any time by mutual agreement of both Parties, or by either Party upon giving the other at least ninety (90) days written notice if one or more of the conditions exist as outlined in Subsection 6.7, DTE's Obligation to Connect.

SECTION 14  
RETIREMENT

Upon termination of this Agreement pursuant to Section 13 or at such time after any of the Interconnection Facilities described herein are no longer required, the Parties shall mutually agree upon the retirement of said Interconnection Facilities which may include without limitation (i) dismantling, demolition, and removal of equipment, facilities, and structures, (ii) security, (iii) maintenance and (iv) disposing of debris. The cost of such removal shall be borne by the Party, as per SECTION 11, owning such Interconnection Facilities.

SECTION 15  
ENTIRE AGREEMENT AND AMENDMENTS

This Agreement and the Michigan Electric Utility Generator Interconnection Requirements shall constitute the entire understanding between the Parties with respect to the subject matter hereof, supersedes any and all previous understandings between the Parties with respect to the subject matter hereof, and bind and insure to the benefit of the Parties, their successors, and permitted assigns. No amendments or changes to this Agreement shall be binding unless made in writing and duly executed by both Parties.

SECTION 16  
NO PARTNERSHIP

This Agreement shall not be interpreted or construed to create an association, joint venture, agency relationship, or partnership between the Parties or to impose any partnership obligation or partnership liability upon either Party. Neither Party shall have any right, power or authority to enter into any agreement or undertaking for, or act on behalf of, or to act as or be an agent or representative of, or to otherwise bind, the other Party.

SECTION 17  
SEVERABILITY

If any provision or portion of this Agreement shall for any reason be held or adjudged to be invalid or illegal or unenforceable by any court of competent jurisdiction or other Governmental Authority, (i) such portion or provision shall be deemed separate and independent, (ii) the Parties shall negotiate in good faith to restore insofar as practicable the benefits to each Party that were affected by such ruling, and (iii) the remainder of this Agreement shall remain in full force and effect.

SECTION 18  
NOTICE TO PARTIES

Unless otherwise provided in this Agreement, any notice, consent or other communication required to be made under this Agreement, shall be in writing and (i) mailed postage prepaid, by certified or registered mail, return receipt requested; (ii) mailed via a nationally recognized overnight delivery service, or (iii) delivered in person to the address as the receiving Party may designate in writing.

All notices shall be effective when received.

SECTION 19  
NO THIRD PARTY BENEFICIARIES

This Agreement is intended for the benefit of the Parties hereto and does not grant any rights to any third parties unless otherwise specifically stated herein.

SECTION 20  
SECTION HEADINGS

The various headings set forth in this Agreement are for convenience of reference only and shall in no way affect the construction or interpretation of this Agreement.

SECTION 21  
COUNTERPARTS AND ELECTRONIC DOCUMENTS

This Agreement may be executed and delivered in counterparts, including by a facsimile or an electronic transmission thereof, each of which shall be deemed an original. Any document generated by the Parties with respect to this Agreement, including this Agreement, may be imaged and stored electronically and introduced as evidence in any proceeding as if original business records. Neither Party will object to the admissibility of such images as evidence in any proceeding on account of having been stored electronically.

IN WITNESS WHEREOF, the Parties hereto have executed this Agreement.

DTE ELECTRIC COMPANY

Customer Name

By: \_\_\_\_\_  
(Signature)

By: \_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Print or Type Name)

\_\_\_\_\_  
(Print or Type Name)

Title: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

Date: \_\_\_\_\_

\_\_\_\_\_  
(Project Developer Name)

By: \_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Print or Type Name)

Title: \_\_\_\_\_

Date: \_\_\_\_\_

Review and Approval		
Reviewer	Initials	Date

EXHIBIT 1  
SCOPE OF FACILITIES

1.1 General Facilities

Such facilities and associated appurtenances as required to interconnect DTE's existing \_\_\_\_\_ distribution line to the Project Developer's new / modified \_\_\_\_\_ Project by way of a new or modified interconnection, which shall include, but shall not be limited to the following:

1.2 Project Developer's Interconnection Facilities

(Insert file containing Project Developer's Interconnection Facilities below)

1.3 DTE's Interconnection Facilities

(Insert file containing DTE's Interconnection Facilities below)

EXHIBIT 2  
WIRING DIAGRAM

EXHIBIT 2  
PROTECTION, COMMUNICATION AND CONFIGURATION REQUIREMENTS AND  
SETTINGS

**Inverter Settings and configuration:**

<b>Voltage Relay Settings</b>		
<b>Shall Trip Function</b>	<b>Allowable Setting</b>	
	<b>Voltage (per unit of nominal voltage)</b>	<b>Clearing Time (Seconds)</b>
Overvoltage 1	1.20	0.16
Overvoltage 2	1.10	2.0
Undervoltage 1	0.70	2.0
Undervoltage 2	0.45	0.32
<b>Frequency Relay Settings</b>		
<b>Shall Trip Function</b>	<b>Allowable Setting</b>	
	<b>Frequency (Hz)</b>	<b>Clearing Time (Seconds)</b>
Overfrequency 1	62.0	0.16
Overfrequency 2	61.2	2.0
Underfrequency 1	58.5	2.0
Underfrequency 2	56.5	0.16

<b>Enter Service Criteria</b>		<b>Default Settings</b>
<b>Permit Service</b>		<b>Enabled</b>
Applicable Voltage Within Range	Min. Value	0.917 p.u.
	Max. Value	1.05 p.u.
Frequency Within Range	Min. Value	59.5 Hz
	Max. Value	60.1 Hz

<b>Power Limiting Setting</b>	<b>Default Settings</b>
Power limiting setting:	<b>## KW</b>

**Relay Settings:**

**Communication requirements:**

ATTACHMENT A: CONSTRUCTION AGREEMENT

ATTACHMENT B: COMMISSIONING CHECKLIST

This document is a Customer commissioning tests form. To be completed and submitted as part of the as-built documents prior to the DTE site visit.

DE-XXXXX Project Name Export Test Plan

Project Address

Name of testing organization: \_\_\_\_\_

Name of Tester: \_\_\_\_\_

Test Date: \_\_\_\_\_

CUSTOMER SCOPE OF WORK TO BE TESTED

- Implement inverter protection settings IEEE1547-2018, Including MISO ride through

TESTING

*Instruction to tester: Clearly Indicate initials in each PASS/FAIL box*

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**Inverter settings verification functionality**

- Open Breaker XXXX (Tested breaker name as in drawings), Verify Open, Close Breaker XXXX

	PASS	FAIL
When Breaker XXXX is Open, verify 0 Voltage on all phases after 2 seconds		
On Breaker XXXX close verify inverter Synchronization check		
On Breaker XXXX close verify that inverter system does not re-energize prior to 300 seconds		
On Breaker XXXX close, and after 300 seconds of de-energization, verify that the inverter system output linearly ramps for no less than 300 seconds before reaching rated output		

*Comments*

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## Voltage Measurement

Test Voltage at meter under the following conditions:

1. With the solar PV disconnected prior to the generation meter. \_\_\_\_\_ Volts.
2. On a sunny day, at the lowest daytime load, with the PV connected. \_\_\_\_\_ Volts.

DTE will make a site visit to finalize testing and approval.

- Verify the following inverter settings are applied

Voltage Relay Settings		
Shall Trip Function	Allowable Setting	
	Voltage (per unit of nominal voltage)	Clearing Time (Seconds)
Overvoltage 1	1.20	0.16
Overvoltage 2	1.10	2.0
Undervoltage 1	0.70	2.0
Undervoltage 2	0.45	0.32
Frequency Relay Settings		
Shall Trip Function	Allowable Setting	
	Frequency (Hz)	Clearing Time (Seconds)
Overfrequency 1	62.0	0.16
Overfrequency 2	61.2	2.0
Underfrequency 1	58.5	2.0
Underfrequency 2	56.5	0.16

Enter Service Criteria		Default Settings
<b>Permit Service</b>		<b>Enabled</b>
Applicable Voltage Within Range	Min. Value	0.917 p.u.
	Max. Value	1.05 p.u.
Frequency Within Range	Min. Value	59.5 Hz
	Max. Value	60.1 Hz

**Tester Signature**

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**Date**

**Owner Signature**

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**Date**

# PROOF OF SERVICE

STATE OF MICHIGAN )

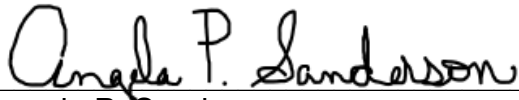
Case No. U-21482

County of Ingham )

Brianna Brown being duly sworn, deposes and says that December 5, 2025 A.D. she electronically notified the attached list of this **Commission Order via e-mail transmission**, to the persons as shown on the attached service list (Listserv Distribution List).

  
Brianna Brown

Subscribed and sworn to before me  
this 5<sup>th</sup> day of December 2025.



Angela P. Sanderson  
Notary Public, Shiawassee County, Michigan  
As acting in Eaton County  
My Commission Expires: May 21, 2030

## Service List for Case: U-21482

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Name	On Behalf Of	Email Address
Anna B. Stirling	MPSC Staff	stirlinga1@michigan.gov
Daniel H.B. Abrams	Environmental Law & Policy Center	dabrams@elpc.org
DTE Electric Company	DTE Electric Company	mpscfilings_account@dteenergy.co
Jon P. Christinidis	DTE Electric Company	jon.christinidis@dteenergy.com
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Justin K. Ooms	Michigan Energy Innovation Business Council	jkooms@varnumlaw.com
Justin K. Ooms	Advanced Energy United	jkooms@varnumlaw.com
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Nicholas N. Wallace	Union of Concerned Scientists, Inc.	nwallace@elpc.org
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Timothy J. Lundgren	Institute for Energy Innovation	tjlundgren@varnumlaw.com
Timothy J. Lundgren	Advanced Energy United	tjlundgren@varnumlaw.com
Timothy J. Lundgren	Michigan Energy Innovation Business Council	tjlundgren@varnumlaw.com
Timothy J. Lundgren	Energy Michigan, Inc.	tjlundgren@varnumlaw.com