



**Cass County
Electric Cooperative**

Interconnection Process for Generation Systems

**As adopted by the Board of Directors of
Cass County Electric Cooperative, Inc.
December 2004**

Cass County Electric Cooperative, Inc.
4100 32nd Avenue S
Fargo, ND 58104
PH: 701-356-4400
PH: 800-248-3292
FAX: 701-356-4502

Table of Contents

Interconnection Process for Generation Systems

Appendix A: Interconnection Process for Generation Systems
Flow Diagram Summary

Appendix B: Application for Interconnection of Generation System

Appendix C: Engineering Data Submittal for the Interconnection of
Generation System

Appendix D: Engineering Studies for Interconnection of Generation
Systems

Appendix E: Interconnection Agreement for Generation Systems

Appendix F: Interconnection Requirements for Generation Systems



Interconnection Process for Generation Systems

- I. INTRODUCTION3
- II. GENERAL INFORMATION4
 - A. Definitions.....4
 - B. Cass County Electric Generation Interconnection Contacts.....5
 - C. Engineering Studies.....6
 - D. Scoping Meeting7
 - E. Insurance7
 - F. Non-Warranty.....8
 - G. Required Documents9
- III. PROCESS FOR INTERCONNECTION9
 - A. Step 1 Application (By Applicant)9
 - B. Step 2 Preliminary Review (By Cass County Electric)10
 - C. Step 3 Go/No-Go Decision for Engineering Studies (By Applicant)11
 - D. Step 4 Engineering Studies (By Cass County Electric).....11
 - E. Step 5 Study Results and Construction Estimates (By Cass County Electric)12
 - F. Step 6 Final Go/No-Go Decision (By Applicant)12
 - G. Step 7 Final Design Review (By Cass County Electric)13
 - H. Step 8 Order Equipment and Construction (By Cass County Electric /Applicant)13
 - I. Step 9 Final Tests (By Cass County Electric / Applicant).....14
 - J. Step 10 (By Cass County Electric).....15
 - K. Step 11 (By Applicant).....15
- IV. ATTACHMENTS15

I. INTRODUCTION

This document has been prepared to explain the process to interconnect a Generation System with Cass County Electric. This document covers the interconnection process for all types of Generation Systems which meet the following criteria:

- A. Rated less than 10MW of total generation Nameplate Capacity
- B. Planned for interconnection with the Cass County Electric Distribution System
- C. Not intended for wholesale transactions
- D. Not anticipated to affect the transmission system.

This document does not discuss the interconnection Technical Requirements, which are covered in the “Cass County Electric Interconnection Requirements for Generation Systems” document. This document and the requirements document also provide definitions and explanations of the terms utilized throughout this process and the documents pertaining to it.

To interconnect a Generation System with Cass County Electric, there are several steps that must be followed. This document outlines those steps (see Section III.) and the Parties’ responsibilities. At any point in the process, if there are questions, please contact Cass County

Electric. Since this document has been developed to provide an interconnection process which covers a very diverse range of Generation Systems, the process appears to be very involved and cumbersome. But for many Generation Systems the process is streamlined and provides an easy means for interconnection.

II. GENERAL INFORMATION

A. Definitions

1. **Area EPS:** an electric power system (EPS) that serves Local EPS's. Note: Typically, an Area EPS has primary access to public rights-of-way, priority crossing of property boundaries, etc.
2. **Area EPS Operator:** the entity that operates the Area EPS.
3. **Closed Transition Transfer:** Method of transferring the local loads between Cass County Electric's system and the generator such that the generator and CCEC 's system are interconnected for a short time (100 msec. or less).
4. **Dedicated Facilities:** the equipment that is installed due to the interconnection of the Generation System and not required to serve other Area EPS Members.
5. **EPS:** (Electric Power System) facilities that deliver electric power to a load. Note: This may include generation units.
6. **Extended Parallel:** The Generation System is designed to remain connected with Cass County Electric for an extended period of time.
7. **Generation:** any device producing electrical energy, i.e., rotating generators driven by wind, steam turbines, internal combustion engines, hydraulic turbines, solar, fuel cells, etc.; or any other electric producing device, including energy storage technologies.
8. **Generation Interconnection Coordinator:** the person or persons designated by Cass County Electric to provide a single point of coordination with the Applicant for the generation interconnection process.
9. **Generation System:** the interconnected generator(s), controls, relays, switches, breakers, transformers, inverters and associated wiring and cables, up to the Point of Common Coupling.
10. **Interconnection Member:** the party or parties who will own/operate the Generation System and are responsible for meeting the requirements of the agreements and Technical Requirements. This could be the Generation System applicant, installer, owner, designer, or operator.

11. **Local EPS:** an electric power system (EPS) contained entirely within a single premises or group of premises.
12. **Open Transition Transfer:** Method of transferring the local loads between Cass County Electric's system and the generator such that the generator and CCEC's system are never interconnected.
13. **Nameplate Capacity:** the total nameplate capacity rating of all the Generation included in the Generation System. For this definition the "standby" and/or maximum rated KW capacity on the nameplate shall be used.
14. **Point of Common Coupling:** the point where the Local EPS is connected to an Area EPS
15. **Point of Delivery:** the point where the energy changes possession from one party to the other. Typically this will be where the metering is installed but it is not required that the Point of Delivery is the same as where the energy is metered
16. **Soft Loading Transfer:** Method of transferring the local loads between Cass County Electric's system and the generator such that the generator and CCEC's system are interconnected for a limited amount of time (generally less than three minutes). If the interconnection extends beyond three minutes, the interconnection is then defined as extended parallel.
17. **Technical Requirements:** Cass County Electric Cooperative, Inc. "Interconnection Requirements for Generation Systems"; see Appendix F.

B. Cass County Electric Generation Interconnection Contacts

Questions that arise during the planning, design, and installation process of interconnecting generation to Cass County Electric's system should be directed to one of two areas depending on the nature of the question.

Areas that involve energy rates and Cass County Electric's load management program should be directed to CCEC's marketing personnel. Technical questions involving areas such as the design, installation, interconnection, or operation of generation should be directed to CCEC's engineering personnel.

In both instances, these people can be reached at the following address and phone number:

Cass County Electric Cooperative, Inc.
4100 32nd Ave SW
Fargo, ND 58104
701/356-4400
800/248-3292

C. Engineering Studies

During the process of designing an interconnection between a Generation System and Cass County Electric, there are several studies which may need to be undertaken. On the Local EPS (Customers side of the interconnection) the addition of a Generation System may increase the fault current levels, even if the generation is never interconnected with the Cass County Electric grid. The Interconnection Customer may need to conduct a fault current analysis of the Local EPS in conjunction with adding the Generation System. The addition of the Generation System may also affect Cass County Electric and special engineering studies may need to be undertaken looking at the Cass County Electric grid with the Generation System included. Appendix D lists some of the issues that may need to receive further analysis for the Generation System interconnection.

While it is not a straight forward process to identify which engineering studies are required, certain criteria can help to identify which Generation Systems may require further analysis. The following is the basic screening criteria to be used for this interconnection process.

1. Generation System total Nameplate Capacity does not exceed 5% of the radial circuit expected peak load. The peak load is the total expected load on the radial circuit when the other generators on that same radial circuit are not in operation.
2. The aggregate generation's total Nameplate Capacity, including all existing and proposed generation, does not exceed 25% of the radial circuit peak load and that total is also less than the radial circuit minimum load.
3. Generation System does not exceed 15% of the Annual Peak Load for the Line Section, which it will interconnect with. A Line Section is defined as that section of the distribution system between two sectionalizing devices in the Cass County Electric grid.
4. Generation System does not contribute more than 10% to the distribution circuit's maximum fault current at the point at the nearest interconnection with the Cass County Electric primary distribution voltage.
5. The proposed Generation System total Nameplate Capacity, in aggregate with other generation on the distribution circuit, will not cause any distribution protective devices and equipment to exceed 85 percent of the short circuit interrupting capability.
6. If the proposed Generation System is to be interconnected on a single-phase shared secondary, the aggregate generation Nameplate Capacity on the shared secondary, including the proposed generation, does not exceed 20KW.
7. Generation System will not be interconnected with a "networked" system

D. Scoping Meeting

During Step 2 of this process, the Applicant or Cass County Electric has the option to request a scoping meeting. The purpose of the scoping meeting shall be to discuss the Applicant's interconnection request and review the application filed. This scoping meeting is to be held so that each Party can gain a better understanding of the issues involved with the requested interconnection.

Cass County Electric and the Applicant shall bring to the meeting personnel, including system engineers, and other resources as may be reasonably required, to accomplish the purpose of the meeting. The Applicant shall not expect Cass County Electric to complete the preliminary review of the proposed Generation System at the scoping meeting. If a scoping meeting is requested, Cass County Electric shall schedule the scoping meeting within the 15 business day review period allowed for in Step 2.

Cass County Electric shall then have an additional 5 days, after the completion of the scoping meeting to complete the formal response required in Step 2. The Application fee shall cover Cass County Electric's costs for this scoping meeting. There shall be no additional charges imposed by Cass County Electric for this initial scoping meeting

E. Insurance

1. In connection with the Interconnection Customer's performance of its duties and obligations under this Agreement, the Interconnection Customer shall maintain, during the term of the Agreement, general liability insurance, from a qualified insurance agency with a B+ or better rating by "Best" and with a combined single limit of not less than:
 - a. Two million dollars (\$2,000,000) for each occurrence if the Gross Nameplate Rating of the Generation System is greater than 250KW.
 - b. One million dollars (\$1,000,000) for each occurrence if the Gross Nameplate Rating of the Generation System is between 40KW and 250KW.
 - c. Three hundred thousand (\$300,000) for each occurrence if the Gross Nameplate Rating of the Generation System is less than 40KW.
 - d. Such general liability insurance shall include coverage against claims for damages resulting from:
 - i. bodily injury, including wrongful death
 - ii. property damage arising out of the Interconnection Customer's ownership and/or operating of the Generation System under this agreement

2. The general liability insurance required shall, by endorsement to the policy or policies:
 - a. Include Cass County Electric as an additional insured
 - b. Contain a severability of interest clause or cross-liability clause
 - c. Provide that Cass County Electric shall not by reason of its inclusion as an additional insured incur liability to the insurance carrier for the payment of premium for such insurance
 - d. Provide for thirty (30) calendar days' written notice to Cass County Electric prior to cancellation, termination, alteration, or material change of such insurance.
3. If the Generation System is connected to an account receiving residential service from Cass County Electric and its total generating capacity is smaller than 40KW, then the endorsements required in Section E.2 shall not apply.
4. The Interconnection Customer shall furnish the required insurance certificates and endorsements to Cass County Electric prior to the initial operation of the Generation System. Thereafter, Cass County Electric shall have the right to periodically inspect or obtain a copy of the original policy or policies of insurance.
5. Evidence of the insurance required in Section E.1. shall state that coverage provided is primary and is not in excess to or contributing with any insurance or self-insurance maintained by Cass County Electric.
6. If the Interconnection Customer is self-insured with an established record of self-insurance, the Interconnection Customer may comply with the following in lieu of Section E.1 – 5:
 - a. Interconnection Customer shall provide to Cass County Electric, at least thirty (30) days prior to the date of initial operation, evidence of an acceptable plan to self-insure to a level of coverage equivalent to that required under section E.1
 - b. If Interconnection Customer ceases to self-insure to the level required hereunder, or if the Interconnection Customer is unable to provide continuing evidence of its ability to self-insure, the Interconnection Customer agrees to immediately obtain the coverage required under section E.1
 - c. Failure of the Interconnection Customer or Cass County Electric to enforce the minimum levels of insurance does not relieve the Interconnection Customer from maintaining such levels of insurance or relieve the Interconnection Customer of any liability

F. Non-Warranty

Neither by inspection, if any, or non-rejection, nor in any other way, does Cass County Electric give any warranty, expressed or implied, as to the adequacy, safety, or other characteristics of any structures, equipment, wires, appliances or devices owned, installed or

maintained by the Applicant or leased by the Applicant from third parties, including without limitation the Generation System and any structures, equipment, wires, appliances or devices pertinent thereto.

G. Required Documents

The following chart lists the CCEC documents required for each type of generation system proposed for use in conjunction with Cass County Electric’s system. By following the steps outlined in this process document and the subsequent documents listed for each type of generation connection transfer type, the Interconnecting Member will assure them of keeping within CCEC’s policy as it relates to the use of a generator in conjunction with receiving electric service from CCEC.

Open Transition	Closed Transition	Soft Loading	Extended Parallel
CCEC Interconnection Process.....			
CCEC Interconnection Requirements for Generation System.....			
	CCEC Application for Interconnection of Generation System.....		
	CCEC Engineering Data Submittal.....		
	CCEC Interconnection Agreement.....		
	CCEC Operating Agreement for Interconnected Generation Systems.....		
	CCEC Maintenance Agreement for Interconnected Generation Systems.....		
			Electric Service Agreement

III. PROCESS FOR INTERCONNECTION

A. Step 1 Application (By Applicant)

Once a decision has been made by the Applicant that they would like to interconnect a Generation System with Cass County Electric, the Applicant shall supply Cass County Electric with the following information:

1. Completed Generation Interconnection Application (Appendix B), including:
 - a. One-line diagram showing the Point of Common Coupling (PCC).
 - b. Site plan of the proposed installation
 - c. Proposed schedule of the installation

2. Payment of the application fee, according to the following sliding scale

Application Fees for Generation System Interconnection Applications				
Project Size/Type	Open Transition	Closed Transition	Soft Loading	Extended Parallel
< 21 KW	N/A	N/A	N/A	\$250
21 – 500 KW	N/A	N/A	N/A	\$250
501 – 750 KW	N/A	N/A	N/A	\$500
751 – 1,000 KW	N/A	N/A	N/A	\$500
> 1,000 KW	N/A	N/A	N/A	\$500

This application fee is to partially offset Cass County Electric’s labor costs for administration, review of the design concept, and preliminary engineering screening for the proposed Generation System interconnection.

3. Completed Engineering Data Submittal (Appendix C) (if applicable), including:

- a. One-line diagram of the generation system showing:
 - i. The generator installation
 - ii. Transfer switch/switchgear
 - iii. Service entrance
 - iv. Lockable and visible disconnect
 - v. Protection and metering CTs and VTs
 - vi. Protective relaying and generator control system
- b. Detailed information on the proposed equipment, including:
 - i. Wiring diagrams
 - ii. Models and types
- c. Proposed relay settings for all interconnection required relays
- d. Detailed site plan of the Generation System

4. Proof of insurance (if applicable):

- a. See Appendix E: XI. Insurance, for detailed requirements

B. Step 2 Preliminary Review (By Cass County Electric)

Within 15 business days of receipt of all the information listed in Step 1, Cass County Electric shall respond to the Applicant with the information listed below. (If the information required in Step 1 is not complete, the Applicant will be notified within 10 business days of what is missing and no further review will be completed until the missing information is submitted. The 15 day clock will restart with the new submittal)

- 1. Contact names with Cass County Electric for this project
- 2. Approval or rejection of the generation interconnection request
 - a. Rejection – Cass County Electric shall supply the technical reasons, with supporting information, for rejection of the interconnection Application
 - b. Approval - An approved Application is valid for 6 months from the date of the approval. Cass County Electric may extend this time if requested by the Applicant

3. If additional specialized engineering studies are required for the proposed interconnection, the following information will be provided to the Applicant. Typical Engineering Studies are outlined in Appendix D.
 - a. General scope of the engineering studies required
 - b. Estimated cost of the engineering studies
 - c. Estimated duration of the engineering studies
 - d. Additional information required to allow the completion of the engineering studies
 - e. Study authorization agreement
4. Comments on the schedule provided

As part of Step 2 the proposed Generation System will be screened to see if additional Engineering Studies are required. The base screening criteria is listed in the general information section of this document.

C. Step 3 Go/No-Go Decision for Engineering Studies (By Applicant)

In this step, the Applicant will decide whether or not to proceed with the required engineering studies for the proposed generation interconnection. If no specialized engineering studies are required by Cass County Electric, this step will automatically be skipped by Cass County Electric and the Applicant.

If the Applicant decides NOT to proceed with the engineering studies, the Applicant shall notify the Cass County Electric Generation Interconnection Coordinator, so other generation interconnection requests in the queue are not adversely impacted. Should the Applicant decide to proceed, the Applicant shall provide the following to Cass County Electric:

1. Payment required by Cass County Electric for the specialized engineering studies
2. Additional information requested by Cass County Electric to allow completion of the engineering studies

D. Step 4 Engineering Studies (By Cass County Electric)

In this step, Cass County Electric will be completing the specialized engineering studies for the proposed generation interconnection, as outlined in Step 2. These studies should be completed in the time frame provided in Step 2 by Cass County Electric. If additional time is required to complete the engineering studies, Cass County Electric shall notify the Applicant and provide the reasons for the time extension.

If Cass County Electric determines that the actual costs for the engineering studies will exceed the estimated amount by more than 25%, the Applicant shall be notified. Cass County Electric shall provide the reason(s) for the studies needing to exceed the original estimated amount and provide an updated estimate of the total cost for the engineering studies. The Applicant shall be given the option of either withdrawing the application, or paying the additional estimated amount to continue with the engineering studies.

E. Step 5 Study Results and Construction Estimates (By Cass County Electric)

Upon completion of the specialized engineering studies, or if none was necessary, the following information will be provided to the Applicant:

1. Results of the engineering studies, if needed
2. Monitoring & control requirements for the proposed generation
3. Special protection requirements for the Generation System interconnection
4. Comments on the schedule proposed by the Applicant
5. Interconnection Agreement (if applicable).
6. Cost estimate and payment schedule for required Cass County Electric work, including, but not limited to:
 - a. Labor costs related to the final design review
 - b. Labor & expense costs for attending meetings
 - c. Required dedicated facilities and other Cass County Electric modification(s)
 - d. Final acceptance testing costs

F. Step 6 Final Go/No-Go Decision (By Applicant)

In this step, the Applicant shall again have the opportunity to indicate whether or not they want to proceed with the proposed generation interconnection. If the decision is NOT to proceed, the Applicant will notify Cass County Electric so that other generation interconnections in the queue are not adversely impacted. Should the Applicant decide to proceed, a more detailed design, if not already completed by the Applicant, must be done, and the following information is to be supplied to Cass County Electric:

1. Applicable up-front payment required by Cass County Electric per Payment Schedule provided in Step 5 (if applicable)
2. Signed Interconnection Agreement (if applicable)
3. Final proposed schedule incorporating the Cass County Electric comments. The schedule of the project should include such milestones as foundations poured, equipment delivery dates, all conduit installed, cutover (energizing of the new switchgear/transfer switch), Cass County Electric work, relays set and tested, preliminary vendor testing, final Cass County Electric acceptance testing, and any other major milestones.
4. Detailed one-line diagram of the Generation System, including the generator, transfer switch/switchgear, service entrance, lockable and visible disconnect, metering, protection and metering CTs / VTs, protective relaying and generator control system.
5. Detailed information on the proposed equipment, including wiring diagrams, models and types.
6. Proposed relay settings for all interconnection required relays

7. Detailed site plan of the Generation System
8. If applicable, drawing(s) showing the monitoring system as specified by Cass County Electric including a drawing which shows the interface terminal block with the Cass County Electric monitoring system
9. Proposed testing schedule and initial procedure, including:
 - a. Time of day (after-hours testing required?)
 - b. Days required
 - c. Testing steps proposed

G. Step 7 Final Design Review (By Cass County Electric)

Within 15 business days of receipt of the information required in Step 6, Cass County Electric will provide the Applicant with an estimated time table for final review. If the information required in Step 6 is not complete, the Applicant will be notified within 10 business days what information is missing. No further review may be completed until the missing information is submitted. The 15 business day clock will restart with the new submittal. This final design review shall not take longer than 15 additional business days to complete, for a total of 30 business days.

During this step, Cass County Electric shall complete the review of the final Generation System design. If the final design has significant changes from the Generation System proposed on the original Application which invalidate the engineering studies or the preliminary engineering screening, the Application for Interconnection of the Generation System request may be rejected by Cass County Electric and the Applicant may be requested to reapply with the revised design.

Upon completion of this step Cass County Electric shall supply the following information to the Applicant.

1. Requested modifications or corrections of the detailed drawings provided by the Applicant.
2. Approval of and agreement with the Project Schedule. (This may need to be interactively discussed between the Parties during this Step)
3. Initial testing procedure review comments. (Additional work on the testing process will occur during Step 8, once the actual equipment is identified)

H. Step 8 Order Equipment and Construction (By Cass County Electric /Applicant)

The following activities shall be completed during this step. For larger installations this step will involve much interaction between the Parties. It is typical for approval drawings to be

supplied by the Applicant to Cass County Electric for review and comments. It is also typical for Cass County Electric to require review and approval of the drawings which cover the interconnection equipment and interconnection protection system. If remote control and/or monitoring are also required by Cass County Electric, those drawings are also exchanged for review and comment.

1. By the Applicant's personnel
 - a. Ordering of Generation System equipment
 - b. Installing Generation System
 - c. Submit approval drawings for interconnection equipment and protection systems, as required by Cass County Electric
 - d. Provide final relay settings provided to Cass County Electric
 - e. Submit Completed and signed Engineering Data Submittal form (Appendix C)
 - f. Submit proof of insurance as required by Cass County Electric interconnection agreements
 - g. Submit required State of North Dakota electrical inspection forms filed with Cass County Electric
 - h. Inspecting and functional testing Generation System components
 - i. Work with Cass County Electric personnel and equipment vendor(s) to finalize the installation testing procedure

2. By Cass County Electric personnel
 - a. Ordering any necessary Cass County Electric equipment
 - b. Installing and testing any required equipment
 - i. Monitoring facilities
 - ii. Dedicated Equipment
 - c. Assisting Applicant's personnel with interconnection installation coordination issues
 - d. Providing review and input for testing procedures

I. Step 9 Final Tests (By Cass County Electric / Applicant)

(Due to equipment lead times and construction, a significant amount of time may take place between the execution of Step 8 and Step 9.) During this time the final test steps are developed and the construction of the facilities are completed. Final acceptance testing will commence when all equipment has been installed, all contractor preliminary testing has been accomplished and all Cass County Electric preliminary testing of the monitoring and dedicated equipment is completed. One to three weeks prior to the start of the acceptance testing of the generation interconnection the Applicant shall provide a report stating:

- ✓ That the Generation System meets all interconnection requirements
- ✓ All contractor preliminary testing has been completed
- ✓ The protective systems are functionally tested and ready
- ✓ Provides a proposed date that the Generation System will be ready to be energized and acceptance tested.

For smaller systems, scheduling of this testing may be more flexible as less testing time is required than for larger systems. In some cases this testing may be done after hours to ensure no typical business-hour load is disturbed. If acceptance testing occurs after hours, Cass County Electric's labor will be billed at overtime wages. During this testing Cass County Electric will typically run three different tests. These tests can differ depending on which type of communication / monitoring system(s) Cass County Electric decides to install at the site. For problems created by Cass County Electric or any Cass County Electric equipment that arise during testing, Cass County Electric will fix the problem as soon as reasonably possible. If problems arise during testing which are caused by the Applicant or Applicant's vendor or any vendor supplied or installed equipment, Cass County Electric will leave the project until the problem is resolved. Having the testing resume will then be subject to Cass County Electric personnel time and availability.

J. Step 10 (By Cass County Electric)

After all Cass County Electric's acceptance testing has been accomplished and all requirements are met, Cass County Electric shall provide written approval for normal operation of the Generation System interconnection, within 3 business days of successful completion of the acceptance tests.

K. Step 11 (By Applicant)

Within two (2) months of interconnection, the Applicant shall provide Cass County Electric with updated drawings and prints showing the Generation System as it was when approved for normal operation by Cass County Electric. The drawings shall include all changes which were made during construction and the testing process.

IV. ATTACHMENTS

Attached are several documents which may be required for the interconnection process. They are as follows:

Appendix A: Flow chart showing summary of the interconnection process

Appendix B: Generation Interconnection Application Form

Appendix C: Engineering Data Submittal Form

Appendix D: Engineering Studies: Brief description of the types of possible Engineering Studies which may be required for the review of the Generation System interconnection

Appendix E: Cass County Electric Interconnection Agreement for Generation Systems

Appendix F: Cass County Electric Interconnection Requirements for Generation Systems



**Cass County
Electric Cooperative**

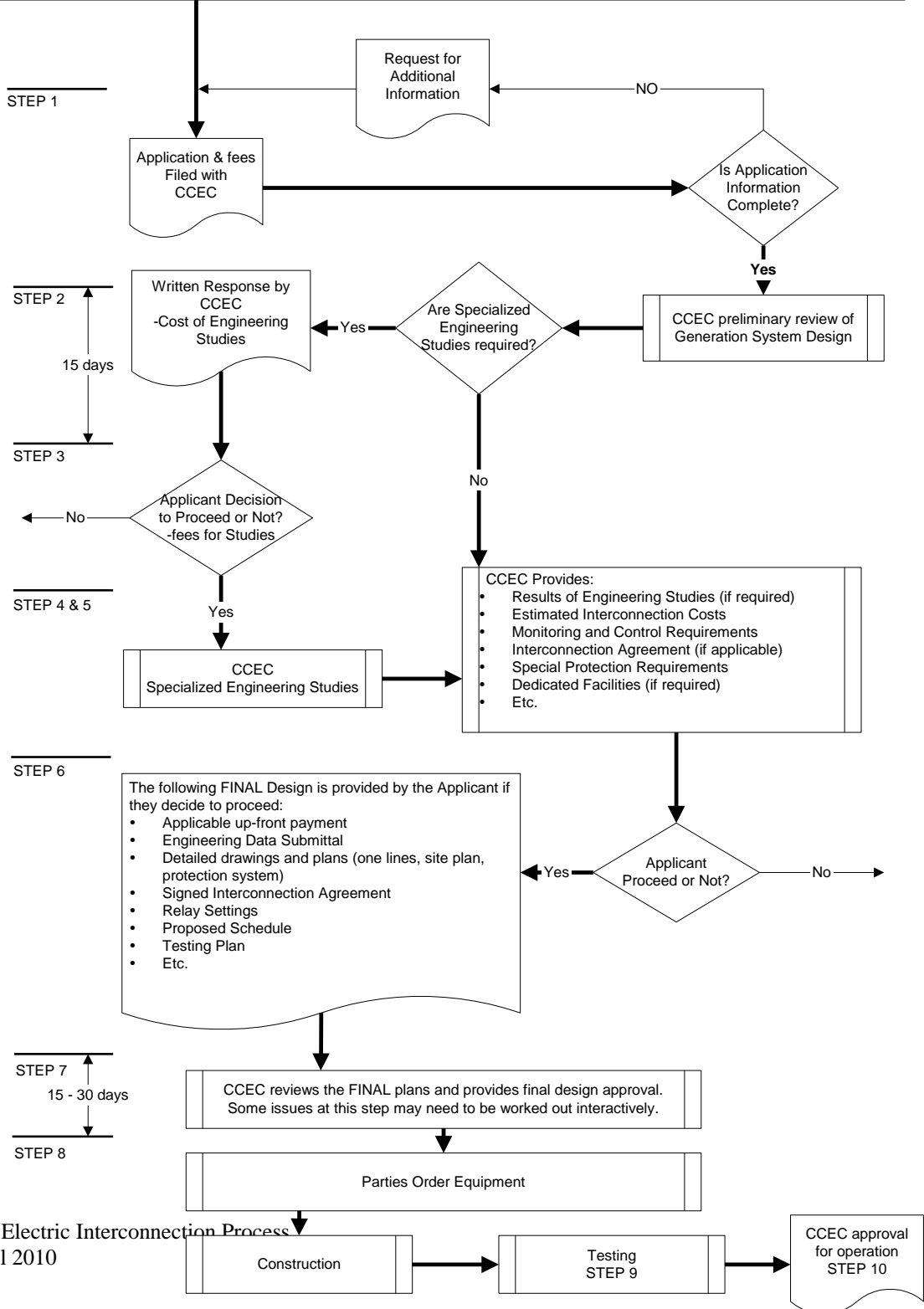
Appendix A

Interconnection Process for Generation Systems Flow Diagram Summary

**As adopted by the Board of Directors of
Cass County Electric Cooperative, Inc.
December 2004**

Cass County Electric Cooperative, Inc.
4100 32nd Avenue S
Fargo, ND 58104
PH: 701-356-4400
PH: 800-248-3292
FAX: 701-356-4502

Before beginning this process, the applicant or their consultant should first obtain information on CCEC's requirements for interconnection of a generator, have a basic design concept in mind, and an electrical one-line diagram of the project prepared. Applicant or their consultant should also be aware of special rates and programs available by using a generator to participate in CCEC's load management program. Please contact CCEC for more information at 701/356-4400 or 1-800-248-3292, or check our web site out at www.kwh.com.





**Cass County
Electric Cooperative**

Appendix B

Application for Interconnection Of Generation System

**As adopted by the Board of Directors of
Cass County Electric Cooperative, Inc.
December 2004**

Cass County Electric Cooperative, Inc.
4100 32nd Avenue S
Fargo, ND 58104
PH: 701-356-4400
PH: 800-248-3292
FAX: 701-356-4502



Application for Interconnection Of Generation System

WHO SHOULD FILE THIS APPLICATION: Anyone expressing interest to install generation which will interconnect with Cass County Electric Cooperative’s system. This application should be completed and returned to CCEC Engineering Department in order to begin processing the request.

INFORMATION: This application is used by CCEC to perform a preliminary Interconnection review. The Applicant shall complete as much of the form as possible. The fields in **BOLD** are required to be completed to the best of the Applicant’s ability. The Applicant will be contacted if additional information is required. The response may take up to 15 business days after receipt of all the required information.

MEMBER/APPLICANT (required)		
Company / Applicant’s Name:		
Representative:	Phone Number:	FAX Number:
Title:		
Mailing Address:		
City:	State:	Zip code:
Email Address:		
LOCATION OF GENERATION SYSTEM INTERCONNECTION		
Street Address, legal description or GPS coordinates:		
PROJECT DESIGN / ENGINEERING (if applicable)		
Company:		
Representative:	Phone:	FAX Number:
Mailing Address:		
City:	State:	Zip code:
Email Address:		
ELECTRICAL CONTRACTOR (if applicable)		
Company:		
Representative:	Phone:	FAX Number:
Mailing Address:		
City:	State:	Zip code:
Email Address:		
GENERATOR SUPPLIER (if applicable)		
Company:		
Representative:	Phone:	FAX Number:
Mailing Address:		
City:	State:	Zip code:
Email Address:		

GENERATOR		
Manufacturer:		Model:
Type (Synchronous Induction, Inverter, etc):		Phases: 1 or 3
Rated Output (Prime kW):	(Standby kW):	Frequency:
Rated Power Factor (%):	Rated Voltage (Volts):	Rated Current (Amperes):
Energy Source (gas, steam, hydro, wind, etc.)		
TYPE OF INTERCONNECTED OPERATION (check all that apply)		
Interconnection / Transfer method:		
<input type="checkbox"/> Open <input type="checkbox"/> Closed <input type="checkbox"/> Soft Loading <input type="checkbox"/> Extended Parallel <input type="checkbox"/> Inverter		
Proposed use of generation: (Check all that may apply)		Duration Parallel:
<input type="checkbox"/> Peak Reduction <input type="checkbox"/> Standby <input type="checkbox"/> Energy Export Sales <input type="checkbox"/> Cover Load		<input type="checkbox"/> None <input type="checkbox"/> Limited <input type="checkbox"/> Continuous
ESTIMATED START/COMPLETION DATES		
Construction start date:		Completion (operational) date:
DESCRIPTION OF PROPOSED INSTALLATION AND OPERATION		
<p>Attach a single line diagram showing the switchgear, transformers, and generation facilities. Give a general description of the manner of operation of the generation (cogeneration, closed-transition peak shaving, open-transition peak shaving, emergency power, etc.). Also, does the Applicant intend to sell power and energy or ancillary services and/or wheel power over CCEC's facilities. If there is an intent to sell power and energy, also define the target market. <Note: If applicant is providing a completed CCEC Engineering Data Submittal form with this application, this part may be omitted; simply note below "See attached Engineering Data Submittal".></p>		
APPLICATION ACKNOWLEDGEMENT & AGREEMENT		
<p>With this Application, CCEC is requested to review the proposed Generation System Interconnection, identify the additional equipment and costs involved with the interconnection of this system to CCEC's system, and to provide a budgetary estimate of those costs. It is understood that the estimated costs supplied by the CCEC will be determined using the information provided. The applicant also agrees to supply as requested, additional information, to allow CCEC to better review this proposed Generation System interconnection. By signing below, the applicant agrees and acknowledges they have read CCEC's Interconnection Requirements for Generation System and will design, operate and maintain the Generation System and interconnection in accordance with those requirements.</p>		
Applicant Name (print):		
Applicant Signature:		Date:



**Cass County
Electric Cooperative**

Appendix C

Engineering Data Submittal For the Interconnection of Generation Systems

**As adopted by the Board of Directors of
Cass County Electric Cooperative, Inc.
December 2004**

Cass County Electric Cooperative, Inc.
4100 32nd Avenue S
Fargo, ND 58104
PH: 701-356-4400
PH: 800-248-3292
FAX: 701-356-4502



**ENGINEERING DATA
SUBMITTAL**
For the Interconnection of Generation

WHO SHOULD FILE THIS SUBMITTAL: Anyone in the final stages of interconnecting a Generation System with Cass County Electric Cooperative, Inc. This submittal shall be completed and provided to CCEC’s Engineering Department during the design of the Generation System, as established in the “CCEC’s Interconnection Process for Distributed Generation Systems”.

INFORMATION: This submittal is used to document the interconnected Generation System. The Applicant’s Engineer (if applicable) should complete as much of the form as applicable and the Applicant shall sign and return the form to CCEC. The Applicant will be contacted if additional information is required.

MEMBER / APPLICANT		
Company / Applicant:		
Representative:	Phone Number:	FAX Number:
Title:		
Mailing Address:		
Email Address:		

If an Application for Interconnection has already been filled out, check this box and continue to page 2.

PROPOSED LOCATION OF GENERATION SYSTEM INTERCONNECTION
Street Address, Legal Description or GPS coordinates:

PROJECT DESIGN / ENGINEERING (if applicable)		
Company:		
Representative:	Phone:	FAX Number:
Mailing Address:		
Email Address:		

ELECTRICAL CONTRACTOR (if applicable)		
Company:		
Representative:	Phone:	FAX Number:
Mailing Address:		
Email Address:		

TYPE OF INTERCONNECTED OPERATION	
Interconnection / Transfer method: <input type="checkbox"/> Open <input type="checkbox"/> Closed <input type="checkbox"/> Soft Loading <input type="checkbox"/> Extended Parallel <input type="checkbox"/> Inverter	
Proposed use of generation: (Check all that may apply) <input type="checkbox"/> Peak Reduction <input type="checkbox"/> Standby <input type="checkbox"/> Energy Export Sales <input type="checkbox"/> Cover Load	Duration Parallel: <input type="checkbox"/> None <input type="checkbox"/> Limited <input type="checkbox"/> Continuous

GENERATION SYSTEM OPERATING INFORMATION	
Fuel Capacity (gals):	Full Fuel Run-time (hrs):
Engine Cool Down Duration (Minutes):	Start time Delay on Load Shed signal:
Start Time Delay on Outage (Seconds):	

GENERATION SYSTEM OPERATION / MAINTENANCE CONTACT INFORMATION		
Maintenance Provider:	Phone #:	Pager #:
Operator Name:	Phone #:	Pager #:
Person to Contact before remote starting of units		
Contact Name:	Phone #:	Pager #:
	24hr Phone #:	

REQUESTED CONSTRUCTION START/COMPLETION DATES	
Design Completion:	
Construction Start Date:	
Footings in place:	
Primary Wiring Completion:	
Control Wiring Completion:	
Start Acceptance Testing:	
Generation operational (In-service):	

Relay Information : Please Include pickup setting and time delay for each protective element			
Relay Type		Relay Model No.	
CT Ratio		VT Ratio	
Under-voltage (27)		Reverse Power (32R)	
Over-current (50/51)		Lockout Relay (86) trips...	
Over-voltage (59)		Synch Check Relay (25)	
Under-frequency (81U)		Parallel Limit Timer (62PL)	
Over-frequency (81O)		Shunt trip breaker (gen, utility)?	

PRIME MOVER (Complete all applicable items)			
Unit Number:	Type:		
Manufacturer:			
Serial Number:		Date of Manufacture:	
H.P. Rated:	H.P. Max:	Inertia Constant:	lb.-ft. ²
Energy Source (hydro, steam, wind, wind etc.):			

SYNCHRONOUS GENERATOR (if applicable)			
Unit Number:	Total number of units with listed specifications on site:		
Manufacturer:	Type:	Phases: 1 or 3	
Serial Number (each)	Date of manufacture:	Speed (RPM):	Freq. (Hz);
Rated Output (each unit) kW Standby:		kW Prime:	kVA:
Rated Power Factor (%):	Rated Voltage(Volts):	Rated Current (Amperes):	
Field Voltage (Volts):	Field Current (Amperes):	Motoring Power (kW):	
Synchronous Reactance (X_d):	% on	kVA base	
Transient Reactance (X'_d):	% on	kVA base	
Subtransient Reactance (X''_d):	% on	kVA base	
Negative Sequence Reactance (X_2):	% on	kVA base	
Zero Sequence Reactance (X_0):	% on	kVA base	
Neutral Grounding Resistor (if applicable):			
I^2t or K (heating time constant):			
Exciter data:			
Governor data:			
Additional Information:			

TRANSFER SWITCH (If applicable)	
Number of Transfer Switches planned _____	Amperage of Switchgear & Transfer Switches
1. Transfer Switch Mfg. _____ Model _____	Switchgear _____ Transfer Switch _____
2. Transfer Switch Mfg. _____ Model _____	Switchgear _____ Transfer Switch _____
3. Transfer Switch Mfg. _____ Model _____	Switchgear _____ Transfer Switch _____
4. Transfer Switch Mfg. _____ Model _____	Switchgear _____ Transfer Switch _____
5. Transfer Switch Mfg. _____ Model _____	Switchgear _____ Transfer Switch _____

INDUCTION GENERATOR (if applicable)			
Rotor Resistance (R_r):	Ohms	Stator Resistance (R_s):	Ohms
Rotor Reactance (X_r):	Ohms	Stator Reactance (X_s):	Ohms
Magnetizing Reactance (X_m):	Ohms	Short Circuit Reactance (X_d''):	Ohms
Design Letter:		Frame Size:	
Exciting Current:		Temp Rise (deg C°):	
Rated Output (kW):			
Reactive Power Required:		k Vars (no Load)	kVars (full load)
If this is a wound-rotor machine, describe any external equipment to be connected (resistor, rheostat, power converter, etc.) to rotor circuit, and circuit configuration. Describe ability, if any, to adjust generator reactive output to provide power system voltage regulation.			
Additional Information:			

INTERCONNECTION (STEP-UP) TRANSFORMER (If applicable)			
Manufacturer:		kVA:	
Date of Manufacture:	Serial Number:		
High Voltage: kV	Connection: delta	wye	Neutral solidly grounded?
Low Voltage: kV	Connection: delta	wye	Neutral solidly grounded?
Transformer Impedance (Z):		% on	kVA base
Transformer Resistance (R):		% on	kVA base
Transformer Reactance (X):		% on	kVA base
Neutral Grounding Resistor (if applicable)			

INVERTER (If applicable)		
Manufacturer:	Model:	
Rated Power Factor (%):	Rated Voltage (Volts):	Rated Current (Amperes):
Inverter Type (ferroresonant, step, pulse-width modulation, etc.):		
Type of Commutation: forced line	Minimum Short Circuit Ratio required:	
Minimum voltage for successful commutation:		
Current Harmonic Distortion	<u>Maximum Individual Harmonic (%)</u> : _____ Maximum Total Harmonic Distortion (%): _____	
Voltage Harmonic Distortion	<u>Maximum Individual Harmonic (%)</u> : _____ Maximum Total Harmonic Distortion (%): _____	
Describe capability, if any, to adjust reactive output to provide voltage regulation:		
NOTE: Attach all available calculations, test reports, and oscillographic prints showing inverter output voltage and current waveforms.		

POWER CIRCUIT BREAKER (if applicable)					
Manufacturer:			Model:		
Rated Voltage (kilovolts):			Rated Ampacity (Amperes):		
Interrupting Rating (Amperes):			BIL Rating:		
Interrupting Medium (vacuum, oil, gas, etc.)			Insulating Medium (vacuum, oil, gas, etc.)		
Control Voltage (Closing):		(Volts)	AC	DC	
Control Voltage (Tripping):		(Volts)	AC	DC	Battery Charged Capacitor
Close Energy (circle one):	Spring	Motor	Hydraulic	Pneumatic	Other
Trip Energy (circle one):	Spring	Motor	Hydraulic	Pneumatic	Other
Bushings Current Transformers (Max. ratio):				Relay Accuracy Class:	
CT'S Multi Ratio? (circle one); No / Yes: (Available taps):					

