



**Engineering Data Submittal
for the Interconnection of
Generation Systems**

Northern Plains Electric Cooperative, Inc.
PO Box 180
Carrington, ND 58421
PH: 701-652-3156
PH: 800-882-2500



Engineering Data Submittal for the Interconnection of Generation

WHO SHOULD FILE THIS SUBMITTAL: Anyone in the final stages of interconnecting a Generation System with Northern Plains Electric Cooperative, Inc. This submittal shall be completed and provided to NPEC's Engineering Department during the design of the Generation System.

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 NPEC. 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:		

NORTHERN PLAINS ELECTRIC COOPERATIVE

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)?	

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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, 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 ² t 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 _

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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)			

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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
Bushing Current Transformers (Max. ratio):	Relay Accuracy Class:
CT'S Multi Ratio? (circle one); No / Yes:	(Available taps):