

AMERICAN RENEWABLES

GAINESVILLE REGIONAL UTILITIES

GAINESVILLE RENEWABLE ENERGY CENTER

OPERATING PROCEDURES

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GREC
OPERATING PROCEDURES

1.0 Introduction

- 1.1 The GREC Operating Procedures, Appendix VI to the Power Purchase Agreement (PPA) between the City of Gainesville, Florida d/b/a Gainesville Regional Utilities (GRU) and the Gainesville Renewable Energy Center, LLC (GREC), is intended to describe the working relationship between GREC and GRU (the Parties.)
- 1.2 The Operating Procedures include, but are not limited to, compliance with (i) the obligations of the PPA, particularly Section 10, Dispatch and Scheduling, (ii) the obligations of the Large Generator Interconnection Agreement (LGIA) between the Parties, particularly Article 8, Communications, and Article 9, Operations, (iii) the requirements of the North American Electric Reliability Corporation (NERC) and the Florida Reliability Coordinating Council (FRCC) listed in the Coordinated Functional Registration Agreement (CFR) (Exhibit “C”), and (iiii) the GRU Facilities Connection Requirements.
- 1.3 It is the intent that the Operating Procedures will reflect the obligations of the Parties resulting from GREC being an independent power producer (IPP) located within the GRU Control Area and the obligations of the Parties resulting from the PPA.

2.0 General Description

- 2.1 The Generating Facility is an independent power producer (IPP) with an original Contract Capacity of 100 MW that is interconnected to GRU’s system in Alachua County, Florida. The Point of Connection is the physical and electrical connection where GREC’s 138 kV transmission line (i.e., Line 18) is terminated on the **dead end in GRU’s Hague Substation**. The Generating Facility consists of a biomass fuel handling system, a biomass-fired boiler, a condensing steam turbine generator with evaporative cooling towers and supporting auxiliary equipment.
- 2.2 The Interconnection Facilities consist of a Generator Step-up Transformer (GSU), a Station Service Transformer (SST), and circuit breakers (CB) 52-1 and 52-2 connecting the GREC Substation located at the Generating Facility to the GRU system at the **Point of Connection located at GRU’s Hague Substation** via approximately 4500 feet of 138 kV string bus, identified as Line 18, between the GRU’s Hague Substation and the GREC Substation.
- 2.3 The Interconnection Point is one and the same as the **Delivery Point**
- 2.4 Interconnection one-line diagrams are included for reference as Exhibit “A”.

3.0 GREC Generating Facility and Substation Circuit Breaker Control

- 3.1 GREC Operator has exclusive control of the Generating Facility Generator Breakers and Auxiliary feed breakers.
- 3.2 GREC Operator has exclusive control of 138 kV circuit breakers (CB) 52-1 and 52-2 that are located in the GREC Substation;

- 3.2 Manual operation of circuit breaker (CB) 52-2 can be performed locally at the GREC Substation or remotely from the Generating Facility control room. The generator is synchronized across circuit breaker (CB) 52-1, which can be controlled manually or automatically only from the Generating Facility control room. Manual control of circuit breaker (CB) 52-1 at the GREC Substation is only possible for test purposes with the associated 138 kV disconnect switches in the open position.
- 3.3 Circuit breakers (CB) 52-1 and 52-2 will open when faults occur on Line 18. This will trip the GREC generator and boiler, which can only be restarted manually. Automatic reclosing of Line 18 to restore Station Service power will be coordinated with GRU's existing system protection. If automatic reclosing is unsuccessful, subsequent manual reclosing will be coordinated with GRU's System Control Center.
- 3.4 Protection Coordination will be accomplished using Standard Utility practice and coordinated by GRU System Protection Personnel
- 3.5 Except during an emergency, operation of these breakers by GREC Operator shall be coordinated with the SCC. Prior coordination of equipment operation is not necessary if the general public, property, or personnel are endangered.

4.0 GRU Switching Station 138 kV Circuit Breaker Control

- 4.1 GRU has exclusive control of the following circuit breakers (CB) that are located in the GRU's Hague Substation; CB 1602, CB 1605, and CB1608.
- 4.2 Manual operation of these breakers can be performed locally at the GRU Switching Station or remotely from the GRU System Control Center (SCC.)
- 4.3 Automatic operation, for fault clearing purposes, originates from protective relaying in GRU's Hague Substation, or adjacent line terminals or from the GREC Substation.
- 4.4 CB 1602 and CB 1608 will open when faults occur on Line 18. This will trip the GREC generator and boiler, which can only be restated manually. Automatic reclosing of Line 18 to restore Station Service power will be coordinated with GRU's existing system protection. If automatic reclosing is unsuccessful, subsequent manual reclosing will be coordinated with GRU's System Control Center.
- 4.5 CB 1602 and CB 1605 will open when faults occur on Line 22. This will not trip the GREC generator. Automatic re-closing will be coordinated with GRU's existing system.
- 4.6 CB 1605 and CB 1608 will open when faults occur on Line 21. This will not trip the GREC generator. Automatic re-closing will be coordinated with GRU's existing system.
- 4.5 Non-emergency manual operation of these circuit breakers, by GRU personnel, shall be coordinated with the Generating Facility personnel. Prior coordination of equipment operation is not necessary if the general public, property, or personnel are endangered.
- 4.7 Protection Coordination will be accomplished using Standard Utility practice and coordinated by GRU System Protection Personnel

- 4.8 Except during an emergency, operation of these breakers by GRU personnel shall be coordinated with the GRU System Control Center (SCC). Prior coordination of equipment operation is not necessary if the general public, property, or personnel are endangered.

5.0 General Operation Requirements

- 5.1 The GREC Operator shall verbally notify the SCC prior to synchronizing the generator to the GRU system. Authorization to perform synchronization shall have previously been authorized by GRU through a request made to SCC via IAM electronic log. The GRU SCC shall make all reasonable efforts to provide permission to dispatch at least 24 hours prior to the requested synchronization or “at minimum load on AGC” time. The GREC Operator shall make all reasonable efforts to provide a request electronically at least 30 hours prior to the requested synchronization or “at minimum load at on AGC” time, the choice of which is at GRU’s discretion.
- 5.2 Except in the case of an emergency, GREC Operator shall verbally and electronically notify the SCC prior to removing the generator from the GRU system. Authorization to remove the generator from the system shall have previously been authorized by GRU through a request approval of the GREC Operator’s Request to Dispatch. The GRU SCC shall make all reasonable efforts to provide at least 24 hours prior to requested generator breaker open time. The GREC Operator shall make all reasonable efforts to provide an electronic request at least 30 hours prior to the requested generator breaker open time.
- 5.3 Generator and generator step up transformer (GSU) and auxiliary power transformer protective relaying shall be in-service during energized operation.
- 5.4 Automatic voltage regulation and governor equipment shall be in-service whenever a generator is connected to the GRU system. In the event that automatic voltage regulation is not in voltage regulation mode or operational, the GREC Operator shall notify the GRU PSC immediately and shall restore automatic voltage regulation as soon as possible. Any notification to the Reliability Coordinator will take place from the GRU SCC per the CFR. Such instances shall be noted in the IAM electronic log.
- 5.5 Various Facility readings are transmitted to the SCC via the Supervisory Control And Data Acquisition (SCADA) system. In the event SCADA is inoperative, GREC Operator will be contacted by GRU using the method of GRU’s choosing and the GREC Operator will provide readings as requested by the SCC by the method of transmittal designated by GRU. Possible methods of transmittal are enumerated in sections 12.1 and 12.2 below.
- 5.6 GREC Operator shall record the hourly Net Electrical Output readings (in MWHs) on a daily basis and, in the case of a failure of GRU’s Net Electrical Output recorder(s), make these readings available to GRU. The SCC will require the Midnight MWH Meter readings for Generation and Auxiliary generation every night as soon after midnight as possible.
- 5.7 Notice shall be provided to GRU’s Assistant General Manager of Energy Delivery regarding design changes affecting the GREC Substation at least thirty (30) Days before the modification is proposed to be implemented. No changes shall be made without GRU's prior written consent, which consent shall not be unreasonably withheld. Such modification may include, but are limited to, GSU tap settings, auxiliary power transformer tap settings, interconnection control design, and interconnection protective relaying.

- 5.8 Notice shall be provided to GRU's Assistant General Manager of Energy Supply regarding design changes affecting the GREC Generating Facility at least thirty (30) Days before the modification is proposed to be implemented. No changes shall be made without GRU's prior written consent, which consent shall not be unreasonably withheld. Such modification may include, but are limited to, turbine, governor, generator or excitation characteristics.
- 5.9 GREC Operator shall maintain at the Generating Facility and keep GRU informed of material revisions or Facility changes covering heat balance diagrams, flow diagrams, relay types, and generator manufacturing information including without limitation the appropriate block diagram model representing the excitation and governor systems for all generators and the actual control system parameters for each block diagram model (covering, without limitation, lead/lag compensation, time constants, and gain values). If GRU reasonably finds that any of the above information must be improved for study purposes such as transmission system transient stability studies, then GREC Operator shall act in a reasonable manner providing such information.
- 5.10 GREC Operator shall prepare an Event Report for each occurrence of derated or diminished operational capability, as defined in NERC GADS, in the Event Report Form, Exhibit "D". Derated or diminished operational capability will include unit output, generator capability, excitation system capability and any other required capability resulting from the Contact or as required to maintain the reliability of the bulk electric system. Event Reports shall be transmitted electronically to GRU with Part I completed as soon as practical after the Event and with Part II completed as soon as practical after the root cause and remedy have been determined.
- 5.11 By April 1 of each calendar year, the GREC Operator shall submit a request for the desired Scheduled Outage periods for the next calendar year. This request will include a schedule identifying the work comprising the critical path. In accordance with the Agreement, Scheduled Outage periods will be approved and then, approximately sixty (60) Days prior to the beginning of the outage, GRU and GREC Operator will review the outage schedule to determine adjustments. Such adjustments may be a result of things like unexpected actual operating hours, maintenance outage work completed, and the results of any inspections performed. The review may include the details of the Scheduled Outage plan which is used by GREC Operator for the execution of the Scheduled Outage. In the event that the meeting results in the Parties agreeing to a duration of the outage different from that originally scheduled, the GREC Operator agrees to adjust the Scheduled Outage to reflect the revised duration. Major changes and updates to the schedule will be reflected on an updated schedule that will be forwarded to GRU no later than thirty (30) Days prior to the start of the outage.
- 5.12 In accordance with NERC Planning Standards the Generating Facility's generator, GSU, and 138:4.16 kV SST protective relays shall be recalibrated per the Operation and Maintenance Plan by a qualified technician. Relay testing shall be completed only during an annual planned outage. In addition to recalibration, protective relaying, including that of GRU, shall be operationally checked. A summary of results of the calibrations will be provided to GRU within thirty (30) Days from the completion of the testing.
- 5.13 In accordance with NERC Planning Standards, the Facility's reactive power capability, voltage regulator controls, speed/load governor controls, and excitation systems dynamic model data shall be tested and verified every five years by a qualified technician. GRU shall be informed, in writing, at least fifteen (15) Days prior to the start of testing and may be present during testing. System modeling data from the testing shall be updated and provided to GRU within sixty (60) Days from the completion of the testing.

5.14 For operating purposes, the Facility shall be referred to as GREC

6.0 Dispatching

- 6.1 The GREC Operator on or before the 20th day of the month shall provide the Monthly Generation Forecast. The hourly data shall be listed in the Generator Profile of IAM GREC PPA Inputs. The submittal should include all scheduled events for the following month that could have a material effect on GRU's generation planning or the reliability of the bulk electric system, including start and finish dates and times.
- 6.2 The GREC Operator, at or before 7:00 AM each day shall provide the Daily Generation Forecast for the following day. The hourly data shall be listed in the Generator Profile of IAM GREC PPA Inputs. The submittal should include planned generation in hourly intervals, all scheduled events for the following day that could have a material effect on GRU's generation planning or the reliability of the bulk electric system.
- 6.3 The GRU SCC shall make all reasonable efforts to provide a five (5) minute notice to the Generation Facility to begin to respond to changes to the requested Power Output, except when the Facility is operated by AGC.
- 6.4 GREC Operator shall typically request a Maintenance Outage at least seven (7) days in advance of the requested start. The request shall be made by the Outage Request in the form of an email to the Power Systems Operation Manager and a duplicate request in the operator electronic log. The Outage Request shall give the proposed start time and duration of the outage, along with the amount of generation capability that will not be available and the equipment that will be worked on. GRU will respond to GREC Operator's request as soon as reasonably practicable. GRU shall respond by approving or denying the Maintenance Outage Request. If a Maintenance Outage request is denied or subsequently delayed or cancelled (as described below), GRU will work with GREC Operator to determine a mutually agreeable time for the start of the Maintenance Outage.
- 6.4.1 GRU shall have the right to revoke its consent to a Maintenance Outage if changed conditions require or reasonably anticipate Dispatch of the capacity scheduled to be unavailable during such Maintenance Outage. GRU shall make its best effort to notify the GREC Operator of such cancelation sufficiently in advance of the Maintenance Outage date as to minimize impact to the Generation Facility. If, in the judgment of the GREC Operator, the Maintenance Outage must be performed to preserve employee safety or avoid significant consequential damage to equipment, the GREC Operator shall have the sole discretion to remove the Generating Facility from service during the originally approved Maintenance Outage dates and times without having such an occurrence be considered a Forced Outage.
- 6.4.2 If reasonably requested by GRU, GREC Operator shall return all or any portion of the Facility that is affected by the Maintenance Outage to full operational status as soon as reasonably practical.
- 6.4.3 If the denial, delay, or cancelation of a Maintenance Outage subsequently results in a Forced Outage of the Generating Facilities, any Forced Outage hours in excess of Maintenance Outage hours associated with the originally requested Maintenance Outage

shall not be use in any calculation set forth in The Contract for the purposes of establishing availability or reliability.

6.4.4 After the release of the unit by GREC of any event involving reduction in available capacity, GRU will, within 48 hours dispatch the unit to its declared available capacity for a period of 15 minutes.

6.4.5 Calculation of available and delivered energy during any outage event shall be calculated using Exhibit “G”.

6.5 GREC Operator may from time to time request that the Generation Facility be dispatched in order to test and/or evaluate its equipment this request will be made via an email to the Power System Operations Manager. GREC Operator shall schedule such request at least one (1) Day in advance by transmittal of the request to GRU. The request shall be subject to GRU's approval, which approval shall not be unreasonably withheld, and GRU’s ability to meet the needs of the system while complying with the request.

7.0 Automatic Generation Control (AGC)

The control of the generation level via AGC will be the responsibility of the GREC Operator. AGC has two separate elements, both of which must be active for AGC to function. The first element is the Generating Facility AGC controller that enables or disables the overall availability of AGC. The second element is the GRU SCC AGC controller that will, upon notification from the GREC Operator that the Generating Facility AGC is enabled, activate AGC from the GRU SCC through to the Generating Facility. When AGC is “ON”, Dispatch will be conducted by the SCC. When AGC is “OFF”, Dispatch will typically be conducted through verbal instructions delivered by the SCC.

7.1 Once the Generating Facility reaches the load and other operating conditions that will allow it to ramp, , the GREC Operator shall enable AGC (when AGC is enabled, the SCC will be sent a status signal indicating this). The GREC Operator shall contact the SCC via the GRU electronic operators’ log via IAM and verbally tell the SCC that the Facility is available for operation on AGC. At that time the SCC may turn “ON” AGC or give another Dispatch.

7.2 If AGC is turned “ON” by the GRU SCC, the Generating Facility output can be modulated between the minimum and maximum output as declared on the daily GREC PPA inputs via IAM.

7.3 During a shutdown of the GREC Facility, AGC will be turned “OFF” and the Facility shutdown will be performed by the GREC Operator.

8.0 Voltage Schedule

8.1 The GREC generator shall be operated in such a way as to maintain a nominal 138kV on the GSU high-side terminals. Deviation from this nominal value may be requested occasionally by the SCC, and the Generating Facility will adhere to such requests provided that operation will not be required outside the design limits of the Generation Facility’s equipment represented by the attached Generator Capability Curve (Exhibit “B”) while maintaining the requested Power Output.

- 8.2 GRU reserves the right to change voltage schedule requirements at their discretion but shall exercise Reasonable Efforts to provide one (1) days advanced notice.
- 8.3 Advanced notice of a change in voltage schedule shall be by the GRU Power Systems Operations Manager via email.
- 8.4 When a change in voltage without advanced notice is required to assure reliability of the Bulk Electric System, the requirement to do so shall be conveyed verbally and noted in the Operating Logs of both Parties.

9.0 Switching

- 9.1 GREC Substation 138 kV switching shall be performed by the GREC Operator. Either Party may lock and tag any device which establishes a clearance boundary. Neither Party is allowed to remove the other Party's locks and tags. The Party requesting switching shall be responsible for checking that all devices are properly cleared.
- 9.2 GRU Switching Station 138 kV switching shall be performed by GRU. Either Party may lock and tag any device which establishes a clearance boundary. Neither Party is allowed to remove the other Party's locks and tags. The Party requesting switching shall be responsible for checking that all devices are properly cleared.
- 9.3 GREC Operator may request routine switching of GRU equipment by contacting the SCC. The request must be made within the parameters set by GRU's Control Center's existing policies and procedures
- 9.4 GRU may request routine switching of Facility equipment by contacting the Facility Plant General Manager or his designee via Phone and/or Radio. Switching is required and the request must specify devices to be switched by the Facility operating numbers (Exhibit "F").

10.0 Transmission Maintenance Outages

- 10.1 GRU will use all reasonable efforts to coordinate maintenance of the 138kV circuit breakers and lines with the maintenance of the Facility.
- 10.2 In order to perform certain maintenance, testing, and repair, GRU will notify GREC Operator five (5) Days in advance of said maintenance, testing and repair, if possible, and if not possible, with as much notice as possible.
- 10.3 GRU will require outages for transmission maintenance during the year GRU will use all reasonable effort to coordinate these outages with GREC's Operator.
- 10.4 The 138kV circuit breakers within the GREC Substation will be maintained according to good utility practice.

11.0 Disturbance Analysis and Service Restoration

- 11.1 GREC Operator may contact the SCC concerning the nature of GRU's line operations, equipment damage, and estimated outage duration.

12.0 Communications

12.1 The parties shall have a common electronic interface between the GREC Control Room and the SCC as the primary means of non-voice (phone), non-real time (SCADA) data. The common electronic interface is the IAM electronic log.

12.2 The following means of voice communication between the GREC Control Room and the SCC shall constitute the minimum level of redundancy:

- Hot line
- Radio
- Hard line
- Cell phone

12.2.1 All verbal communication related to directives between the SCC and the GREC Operator shall use 3-way communication as defined by NERC, FRCC and GRU policy and procedure.

12.3 The following GREC Operator personnel are authorized to request switching from GRU.

Plant General Manager or designee

12.4 The following GRU personnel are authorized to request switching from GREC Operator:

- Systems Operations Manager or designee (GRU SCC)
- System Operator or designee (GRU SCC)
- Power Systems Coordinator II or designee (GRU SCC)

12.5 Updates to these lists should be made in writing to:

Director of Power System Operations
Gainesville Regional Utilities
P.O. Box 147117, Station A132
Gainesville, Florida 32614-7117

Plant Manager
Gainesville Renewable Energy Center
NAES Corporation
11201 NW 13th St
Gainesville, FL 32653

12.6 For contact information, see Exhibit "F".

13.0 Modifications

13.1 The Operating Procedures may be modified at any time by written agreement of both Parties. The Parties agree to meet as needed for the purpose of reviewing past operation and revising the Operating Procedures.

13.2 GREC Operator and GRU shall work together on a plan to identify possibilities for reducing the requests for startup and shut downs times. Any conclusions resulting from this effort must be mutually agreed to by both Parties. These conclusions may include capital improvements or other modifications in equipment, control schemes or operations practices. All costs and responsibility for said costs, to include the cost of researching, developing, planning, implementing and testing any changes associated with agreed-upon improvements shall be mutually agreed to by the Parties prior to any activity by either Party. This joint effort shall be concluded one (1) year from the Effective Date or as mutually agreed to by the Parties. However, any changes being implemented at the end of the one (1) year period will be allowed to be completed within a reasonable period of time.

14.0 Governing Documents

14.1 In the event of a conflict between the Operating Procedures and the Contract, the Contract shall control.

DEFINITIONS

All capitalized terms used herein and not defined herein are used as defined in the Agreement. In addition, the following capitalized terms shall have the following meaning:

Agreement – The First Operating Agreement between Gainesville Regional Utilities and Gainesville Renewable Energy Center, LLC dated _____

GREC Operator – GREC, LLC

SCC - GRU System Control Center or its designee.

GRU – Gainesville Regional Utilities

Power Output – The instantaneous output of the Facility, measured in MW, delivered to GRU at the interconnection point.

Return to Service – GREC has been returned generating service from an off line condition such as hot standby (HSB), cold standby (CSB), forced outage, etc. Return to Service shall be defined as when the unit is at minimum net output or 70 MW on AGC and capable of ramping to full load a 3 MW/minute. All time references to Return to Service shall be to these conditions.