BEFORE
THE PUBLIC UTILITIES COMMISSION OF OHIO

In the Matter of the Joint Application of Ohio Power Company and Sofidel America for Approval of a Special Arrangement Agreement	))))	Case No. 17-0043-EL-EEC

JOINT APPLICATION FOR APPROVAL OF A SPECIAL ARRANGEMENT AGREEMENT BETWEEN OHIO POWER COMPANY AND SOFIDEL AMERICA

Pursuant to Ohio Revised Code ("R.C.") sections 4928.66 and 4905.31(E) and Rule 4901:1-39-05(G), Ohio Administrative Code ("O.A.C."), Ohio Power Company d/b/a AEP Ohio ("Company") and Sofidel America ("Customer") (collectively, "Applicants") submit this Joint Application for Commission approval of the special arrangement described in this Joint Application and accompanying attachments whereby Customer allows combined heat and power ("CHP") energy efficiency ("EE") resources to count toward the Company's compliance with the EE benchmarks set forth in Amended Substitute Senate Bill 221.

Amended Substitute Senate Bill 221 sets forth in R.C. 4928.66 EE benchmarks that electric distribution utilities shall be required to meet or exceed. The statute allows utilities to include EE resources committed by mercantile customers for integration into the utilities programs to be counted toward compliance with a utility's EE benchmarks. The statute also enables the Commission to approve special arrangements for mercantile customers that commit EE resources to be counted toward compliance with a utility's EE benchmarks. Further, the statute specifically allows CHP to be an eligible EE resource

and requires the Commission to estimate or approve the estimation methodology herein of the CHP project EE savings, the approved EE Plan allows the CHP project to be counted with incentives determined by the Company and the statute authorizes the Commission to take actions necessary to administer the implementation of existing portfolio plans as this Joint Application is requesting. The Company is an electric distribution utility as defined in R. C. 4928.01(A). The Customer is a Mercantile customer as defined in R.C. 4928.01(A)(19).

In its application to the Company, the Customer has agreed to commit the EE resources identified in this Joint Application to the Company's compliance toward the EE benchmarks in Amended Substitute Senate Bill 221.

The Company has worked with the Customer extensively to develop this project starting late 2016 and will continue to support the Customer's decision to move forward and implement this project in 2018 (the project is not yet in service). The Company has reviewed the details submitted in this Joint Application and based upon a thorough review of the available records believes that the project planned in this Joint Application satisfies the requirements in R.C. 4928.66, meets all existing Company EE Plan requirements as a CHP project and furthers the State of Ohio's policy goals of reducing energy costs in a highly cost effective manner. Further, approval of this application can help reduce costs to all customers due to the project's relative size, energy and demand savings and associated net benefits generated.

This CHP project is a prospective project and eligible under Company's approved EE Program Portfolio Plan, as such the project and costs are already identified as part of the EE and PDR portfolio costs. CHP is allowed by statute to count as an EE resource. This cost effective technology is subject to the Commission's approval of the methodology for and estimation of energy savings as required by

statute. The incentive amounts and strategy provided by the Joint Applicants is determined by the Company based on energy savings and approved by the Commission through the EEC Application process.

Exhibit 1 with attachments (Application to Commit Combined Heat and Power System) to this Joint Application includes a project overview that outlines the project, customer size, project installation date, estimated EE savings resulting from the project, eligible incentive, and the cost effectiveness of the project. Exhibit 1 also provides the signature of the Customer indicating the validity and acceptance of the information, the Customer's support of this Joint Application, and the Customer's intent to participate in the program. The Applicants attest to the fact that the program in this Joint Application complies with the presumption that the mercantile projects are part of a demand response, energy efficiency, or peak demand reduction program to the extent the project either provides for early retirement of functioning equipment which is not yet fully depreciated, or achieves reductions in energy use and peak demand that exceed the reductions that would have occurred had the customer used standard new equipment, to the extent standard is defined by current code or statute.

Consistent with the requirements of Rule 4901:1-39-05(G), O.A.C., Applicants agree that approval by the Commission of the Joint Application will result in an arrangement that: 1) addresses coordination requirements between the electric utility and the mercantile customer with regard to voluntary reductions in load by the mercantile customer, which are not part of an electric utility program, including specific communication procedures, if necessary; 2) grants permission to the electric utility and Commission staff to measure and verify the EE savings resulting from customer-sited projects and resources; and 3) identifies all consequences of noncompliance by the customer with the terms of the commitment. Exhibit 2

(Energy Efficiency Resource Commitment Agreement) is a copy of the formal agreement that commits the Customer's project for integration into the Company's programs to be counted toward compliance with the Company's EE benchmarks and reflects the "Rules and Requirements" agreed to by the Customer.

The Customer has provided the Company documentation necessary to calculate energy and demand savings resulting from the project described in Exhibit 1 and the accompanying attachments. The Company uses methodologies, protocols and/or practices that conform to the general principles of the International Performance Measurement Verification Protocol (IPMVP) in order to justify the energy savings. In the case of this Combined Heat and Power (CHP) project submittal, the Company will rely on the initial estimate of electricity produced by the CHP system and verify those as savings to be counted using the metered electricity production as the measurement of the energy efficiency and demand reduction savings committed to Company.

As shown in Exhibit 1, the Customer must comply with any Commission requirement to provide an annual report on the energy savings and electric utility peak- demand reduction. However, the Customer has agreed and the Company will file as part of its annual EE/PDR Portfolio Status report each year the metered electrical demand and energy production which is equivalent to the energy and demand savings from this project, relieving the Customer of a separate filing requirement if the Commission so approves.

Due to the large size of this project and potential for reducing opportunities other customers may have to participate in energy efficiency programs and to reduce total portfolio program costs over the next two years, the Company requests to count half of the energy and demand savings toward its EE compliance benchmark in 2019 and the

remaining half counted toward it EE compliance benchmark in 2020. In addition, splitting the energy efficiency and demand reductions in two years is supported by revised code 4928.66 (B), which states: "For purposes of a waste energy recovery or combined heat and power system, an electric distribution utility shall not apply more than the total annual percentage of the electric distribution utility's industrial-customer load, relative to the electric distribution utility's total load, to the annual energy efficiency savings requirement." The Company believes it is prudent to split the 100 GWh in annual savings between 2019 and 2020, counting approximately 50 GWh each year to provide opportunities for other customers' CHP projects. The Company expects to file additional projects based on interest received. Approval of this project by the Commission may also further spur interest. Allowing the counting of this large project in this manner maintains opportunities for other customers. Splitting the savings reduces the allowable savings, while maintaining significant opportunities for other customers in 2019and 2020. Further, splitting the EE savings provides overall cost saving opportunities for all commercial and industrial customers in each year.

Shared Savings for CHP project is clearly allowed and will be counted in the same manner as identified in Case No. 16-0574-EL-POR, recognizing that the Company has an approved EE and PDR Program Portfolio Plan in accordance with amended substitute SB 310. The Company is requesting that the Commission affirm the Company's interpretation that shared savings is allowed for this project. Further, the Company is requesting that shared savings be split in a similar manner as the EE savings with half the shared savings from this project counted in 2019 and the remaining half counted in 2020, in order to directly lower overall energy efficiency plan costs in both 2019 and 2020 for commercial and industrial customers specifically and all customers generally. If all the EE savings and shared savings are counted in 2019 for this large

project, the opportunity is lost to also reduce costs overall in 2020, as the Company will continue to work toward reaching EE savings goals and meeting shared savings goals. Further, opportunities for other commercial and industrial customers will be more limited in 2019 due to the size of this project. Without a split of EE savings and shared savings in 2019 and 2020, the Company will need to spend more than necessary to meet EE savings requirements and achieve shared savings goals in 2020. In addition, counting this large project one hundred percent in 2019 can lead to ramping down commercial and industrial programs in 2019 and then ramping back up to reach goals in 2020, which could raise acquisition costs unnecessarily. This outcome would not be favorable for customers and can be avoided with the requested split.

In Case No. 16-0574-EL-POR, the Stipulation allows counting of shared savings only one time and in the year in which the savings are generated. Shared savings will only be counted once (no double counting) and the CHP project does physically generate the savings each year, providing the Commission flexibility to count the shared savings in a method other than in the year in which the project is completed for this limited exception due to the benefits it provides for all customers. Splitting the shared savings between 2019 and 2020 conforms to all requirements of the Stipulation.

Approval of this project with the customer incentives provided and inclusive of shared savings has the potential to reduce overall costs to achieve energy and demand savings for 2019 and 2020, thereby reducing costs for all customers. This Joint Application is contingent upon the Company receiving approval of shared savings at 100% subject to the cap, calculations shown in Exhibit 3.

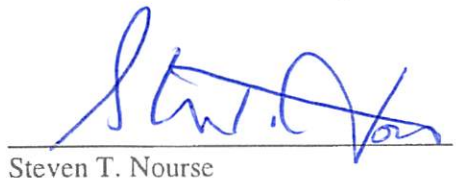
For these reasons, the Applicants request that the Commission approve the Joint Application and the Company's methodology for estimating EE savings and applying the Customer's energy efficiency resources to the Company's energy and

demand benchmarks as identified in SB 221 and support the Company's authority to determine and pay the CHP program incentive payment as defined in Exhibit 2 and the EE savings and shared savings split counting methodology outlined in the Joint Application.

As demonstrated above, approval of this is permitted under the Company's existing EE/PDR Portfolio Plan. More specifically, all costs associated with this Application will be recovered as a part of the CHP Program under the 2017 EE/PDR Portfolio Plan. The costs recovered in this Application will reduce program costs in the Business programs portion of the EE/PDR Portfolio Plan. Upon approval, the agreement will be implemented and the Company will reflect the cost recovery and any cost savings as part of the EE/PDR Rider.

While the Company retains the right to respond to any objections or comments that maintain otherwise, the incentives specified are acceptable to the Company and the Customer and should be considered for approval by the Commission.

Respectfully submitted,



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Counsel for Ohio Power Company

EXHIBIT 1

Ohio | **Public Utilities Commission**

Application to Commit
Combined Heat and Power System
(Mercantile Customers Only)

Case No.: 17-0043- EL-EEC

Mercantile Customer: Sofidel America

Electric Utility: American Electric Power (AEP) – Ohio Power Company

Program Title or
Description: Sofidel America Tornado Combined Heat and Power

Ohio Revised Code (O.R.C.) 4928.66 (A) (1) (a), allows that an electric utility's energy efficiency program may include a combined heat and power (CHP) system. The following application form is to be used by mercantile customers, either individually or jointly with their electric utility, to apply for commitment of such programs.

Complete a separate application for each customer program. Projects undertaken by a customer as a single program at a single location or at various locations within the same service territory should be submitted together as a single program filing, when possible. Check all boxes that are applicable to your program. For each box checked, be sure to complete all subparts of the question, and provide all requested additional information. Submittal of incomplete applications may result in a suspension of the automatic approval process or denial of the application.

Any confidential or trade secret information may be submitted to Staff on disc or via email at ee-pdr@puc.state.oh.us.

Section 1: Mercantile Customer Information

Name:

Principal Address:
25910 US 23
Circleville, Ohio 43113

Address of facility for which this energy efficiency program applies:
25910 US 23
Circleville, Ohio 43113

Name and telephone number for responses to questions:
Andrea Wong – Process Engineer
Mobile: 918-934-7994
E-mail: Andrea.Wong@sofidelamerica.com

Electricity use by the customer (check the box(es) that apply):

- ☒ The customer uses more than seven hundred thousand kilowatt hours per year at the above facility. (Please attach documentation.)
- ☐ The customer is part of a national account involving multiple facilities in one or more states. (Please attach documentation.)

Section2: Application Information

A) The customer is filing this application (choose which applies):

- ☐ Individually, without electric utility participation.
- ☒ Jointly with the electric utility.

B) The electric utility is: Ohio Power Company (AEP Ohio)

Section 3: Request for Cash Payment Reasonable Arrangement (Option 1) or Exemption from Rider (Option 2)

Under this section, check the box that applies and fill in all blanks relating to that choice.

A) The customer is applying for:

☒ Option 1: A cash payment reasonable arrangement.

OR

☐ Option 2: An exemption from the energy efficiency cost recovery mechanism implemented by the electric utility.

B) The value of the option that the customer is seeking is:

Option 1:

☒ A cash payment of $0.007 per net kWh for 5 years capped at $400,000 per year for each plant. The estimated annual incentive at this rate for the two plants is $700,000.

Sofidel and AEP Ohio have agreed to count each CHP installation as separate projects since they are separate systems, can operate independently and are starting up on different dates. However a lower project cap has been agreed upon to reduce overall costs and encourage additional participants in the program.

Option 2: An exemption from payment of the electric utility's energy efficiency/peak demand reduction rider.

☐ An exemption from payment of the electric utility's energy efficiency/peak demand reduction rider for ____ months (not to exceed 24 months). (Attach calculations showing how this time period was determined.)

OR

☐ Ongoing exemption from payment of the electric utility's energy efficiency/peak demand reduction rider for an initial period of 24 months because this program is part of the customer's ongoing efficiency program. (Attach documentation that establishes the ongoing nature of the program.) In order to continue the exemption beyond the initial 24 month period, the customer will need to

provide a future application establishing additional energy savings and the continuance of the organization's energy efficiency program

Section 4: Cost Effectiveness

The CHP system is cost effective because it has a benefit/cost ratio greater than 1 using the (choose which applies):

1. Total Resource Cost Test (TRC). The calculated TRC value is: _____ (Continue to Subsection 1, then skip Subsection 2)

2. Utility Cost Test (UCT). The calculated UCT value is: 26.1_ (Skip to Subsection 2.)

Subsection 1: TRC Test Used (please fill in all blanks).

The TRC value of the CHP system is calculated by dividing the value of our avoided supply costs (generation capacity, energy, and any transmission or distribution) by the sum of our program overhead and installation costs and any incremental measure costs paid by either the customer or the electric utility.

Subsection 2: UCT Used (please fill in all blanks).

We calculated the UCT value of our CHP system by dividing the value of our avoided supply costs (capacity and energy) by the costs to our electric utility (including administrative costs and incentives paid or rider exemption costs) to obtain our commitment.

Section 5: Combined Heat and Power System Information

Additional information to clarify or supplement this Application may also be requested by Staff. Please fill out this form and attach the following supporting documentation to this application:

Criteria 1: CHP Efficiency Level

Ohio Revised Code (ORC) Sec. 4928.01(40)

1) State the overall combined heat and power (CHP) systems' efficiency level and describe how it was determined.
The CHP overall efficiency is 79.7%, based on LHV (Lower Heating Value). See Exhibit 1 Attachment 1

Criteria 2: Amount of Useful Thermal Energy

Ohio Revised Code (ORC) Sec. 4928.01(40)

1) State the systems' amount of thermal energy produced.
The systems' useful thermal energy produced is 874,875 MMBtu/yr for 2 CHP assuming the heat exchangers are off (not winter) and both paper mills are running the same grade.

There are two CHP plants on the site.
For 1 CHP plant and a designated paper grade:
Steam produced is 27,748 lb/hr at 406F or 1202 Btu/lb. The steam returned is 18,570 lb/hr at 250F or 218.3 Btu/lb. The remaining 9295 lb/hr make up water is supplied from wells at 70F or 381.7 Btu/lb.

Assume there is an average of 730 hrs/month (8760 hrs/yr).
However, it is assumed that there is 240 hours of maintenance or downtime (Co-generation is OFF). Then actual worked hours the co-generation is 8520 hours/yr.

Energy Provided = 27,748 lb/hr * 1202 Btu/lb = 33.35 MMBtu/hr
Returned = 18,570 lb/hr * 218.3 Btu/lb = 4.05 MMBtu/hr
Make-up = 9295 lb/hr * 381.7 Btu/lb = 3.55 MMBtu/hr

Useful thermal energy from Turbine Exhaust is 7500 kW
Energy from Exhaust = 7500 kW * 3412.142 Btu/hr/kW = 25.59 MMBtu/hr

Useful Thermal Energy Supplied for 1 CHP = Energy Provided – Returned – Makeup + Energy from Exhaust = 51.34 MMBtu/hr = 437,437 MMBtu/yr

Total Useful Thermal Energy for 2 CHP = 874,875 MMBtu/yr

The values may vary since these values are for one type of paper (or "grade"). In this particular example, the values are for the designed grade.

2) State the systems' use for that thermal energy (e.g. domestic hot water, process hot water, process steam, space heating, absorption chiller, etc.)
The system is used to provide steam for the paper mill plant for process heat and providing electricity needs for the plant.

Criteria 3: Service Date

Ohio Revised Code (ORC) Sec. 4928.66 (A)(1)(a)

1) Provide the date that the system was or will be placed into service.
The system is expected to be placed into service on March 2018 for one CHP facility (CHP1) and October 2018 for the second CHP facility (CHP2). The 12 month implementation meter readings are expected to begin November 15, 2018.
2) Provide the date that the system was retrofitted and describe the retrofit (if applicable).
Not available.

Section 6: Additional Information

Please attach the following supporting documentation to this application:

- A copy of the formal declaration or agreement that commits the program or measure to the electric utility, including:

    1) any confidentiality requirements associated with the agreement;
    2) a description of any consequences of noncompliance with the terms of the commitment;
    3) permission by the customer to the electric utility and Commission staff and consultants to measure and verify energy savings and/or peak-demand reductions resulting from your program; and
    4) a commitment by the customer to provide an annual report on your energy savings and electric utility peak-demand reductions achieved.

- A description of all methodologies, protocols, and practices used or proposed to be used in measuring and verifying program results. Additionally, identify and explain all deviations from any program measurement and verification guidelines that may be published by the Commission.

1. SYSTEM DESCRIPTION

Provide a description of the Combined Heat and Power (CHP) system.

a. Describe the technology/configuration, e.g. Combustion Gas Turbine, Power Boiler with Steam Turbine, Reciprocating engine(s) or other.
The CHP system consists of two cogeneration plants (CHP1 and CHP2) that will mirror each other as much as possible. Each cogeneration plant will have a Solar Taurus 70 gas turbine (GT) that will exhaust into a plenum that will be used in the hoods for the paper machine drying process or into a mixer that then the exhaust gas will go to a heat recovery steam generator (HRSG). The GT will have an extended duct for possible addition of a selective catalytic reduction (SCR) system.
The exhaust from the Yankee hoods will then enter the HRSG that will be capable of duct firing to produce steam for normal operating conditions. The auxiliary boiler will supplement the remaining necessary steam.
In normal operation, two HRSGs and one auxiliary boiler will be running to produce the necessary steam for the two paper machines. The second auxiliary boiler will be used as a backup. The auxiliary boilers will alternate when they will be in operation.

b. Describe the type of business/facility that will benefit from the useful thermal energy to be supplied by the cogeneration. Include a description of how the thermal energy will be used throughout a representative year and whether there are any hourly, daily or seasonal variations in thermal demand. If applicable, describe the system replaced by the CHP facility.
Sofidel America, a Sofidel's US subsidiary, will be starting up two new tissue machines and converting plant in our Greenfield plant currently under construction in Circleville, OH. The CHP will be providing steam to the tissue machines, and electricity to the paper mill plant.
There will be variations in thermal demand due to our process (different grade of paper needs different thermal demand) and seasonal variations (peaks during the winter).

2. EQUIPMENT DESCRIPTION

Provide a complete equipment description for all major components including: Combustion Turbine Generator, Steam Turbine Generator, HRSG, plant control system, air emissions control equipment, cooling system, major pumps, water treatment system, fuel storage facilities, etc.

a. Equipment manufacturer/model/date of manufacturer.

There will be two CHP facilities, mirror-image of each other. The following list is for <u>one</u> CHP facility.

- Gas Turbine (GT) – Solar 70 Taurus generator package by Solar Turbines – The gas turbine is a Solar Taurus 70 expected to generate 7.5 MW at 59F. The

generator (Serial No 41998) will be manufactured by Kato Engineering (Siemens Industrial Automation). The gas turbine is expected to be manufactured in 2017. The CHP system design, if necessary, can accommodate a future selective catalytic reduction (SCR) system and aqueous ammonia as reductant for the SCR. The SCR can be placed after the GT. The exhaust gas will be expelled to an exhaust plenum that will provide make-up air to the Yankee hood system of the paper machine and/or to a mixer where the gas will go directly to the HRSG.

- Heat Recovery Steam Generator (HRSG) – Victory Energy – The HRSG will be manufactured by Victory Energy and is expected to be completed in 2017. Exhaust air from the paper mill process will enter an exhaust mixer and will be used in the HRSG. In designed conditions, the HRSG will be able to supply 15,039 lb/hr of steam, and up to a maximum of 22,442 lb/hr of steam of 250 psig saturated steam.
- Auxiliary Boiler – Victory Energy – The auxiliary boiler is a package boiler that will be ideally utilized 50% of the time and will take turn in providing the remaining necessary steam for the two paper machines with the other auxiliary boiler in the other CHP facility. Each boiler can supply up to 37,747 lb/hr (nominal) of 250 psig saturated steam at 65F ambient temperature.
- Deaerating Feedwater System – Superior Boilers, Model MSTCO40D290-260 – The deaerator will be supplied by Superior Boilers and manufactured in 2017. It is a pressurized tray type deaerator for 40,000 lb/hr used for two boilers (HRSG and aux boiler) at 260 psig operating pressure. It has a 1200 gallon storage tank (15.8 minutes).
    - The feedwater pumps are two centrifugal pumps by Grundfoss Model CR32-11-2.
- Water Treatment system
    - Softener and Reverse Osmosis (RO) systems will be in use to remove impurities and soften the water before going into the DA feedwater system and to the boilers. The softener and RO systems will be provided by Marlo, Inc. The softener will be a twin alternating water softener (model MRG-900-3) and the RO system will be model MRO-58K-8H.
- Fresh Air fans
    - There will be two fans provided by Valmet that will be providing fresh air into the duct (before the plenum or mixer) to lower the temperature (to process temperature level)of the exhaust gas sent by the turbine.
- 2 Hoods – Although the hoods are not in the CHP building, they are part of recovering the exhaust gas from the turbines and their exhaust gas will be sent to a mixer which then will go to the HRSG. Valmet will be providing the hoods.
- Heat Exchangers
    - There will be four steam heat exchangers provided by Valmet that will be used as heat recovery units to provide heat in the ventilation system during winter.

- Plant Control System: The DCS controllers are from Siemens.

3. OPERATION MODES

a. Describe and list the major operating modes of the CHP system and projected time period (per annum) that each mode will be utilized.
The CHP system is expected to be in operation 8520 hours of the year in normal conditions. Normal operation consists of utilizing both turbines and HRSGs with additional steam input from one auxiliary boiler at the same time. The second auxiliary boiler will be there as backup in case the HRSGs or the operating auxiliary boiler have unplanned shut downs or have planned maintenance. The remaining 240 hours of the year consists of the CHP starting up, maintenance shut down, HRSG by-pass, and/or turbine by-pass. The turbines will still be able to run and supply electrical power to the plant even if the HRSGs are shut down.

b. Will the system include a "thermal dump"?
   i. A "thermal dump" refers to a sub-system of the CHP that rejects heat allowing the system to generate electricity during periods when the full useful thermal output of the heat recovery system cannot be transferred due to insufficient demand.
   There will be steam vents and by-pass stacks.

4. PROCESS FLOW DIAGRAM

a. Provide a process flow diagram for each major operating mode.
   See Exhibit 1 Attachment 2

b. Include locations for all meters.
   See Exhibit 1 Attachment 2

5. MATERIALS AND ENERGY BALANCE DIAGRAMS

a. For each fuel, include the flow (lb/hr), temperature (F), pressure (psia), and enthalpy (BTIJ/lb) for all water, steam combustion air, and fuel streams entering and exiting the boundaries of the generating unit and of each major equipment component.
   See Exhibit 1 Attachment 1

6. ELECTRICAL

a. ELECTRICAL GENERATOR
   i. Manufacturer/Model Number/Output Volts/Capacity
   Kato Engineering (part of Solar Turbines GT package)/SN41998/12470V/7292kW

b. Is the generation unit designed or approved to export power onto the electric grid?
No, it is not designed to export power onto the electrical grid.
There will be some "unintentional" export capability.

This is only for rare cases; for example when the paper machine(s) suddenly shuts down and our generators are still running. If exporting does happen, it is expected to be a maximum net export capability of 6 MW for both generators, in a short period of time; afterwards the relay will trip due to having reverse power relay.

See Exhibit 4 Interconnection Application for more information

c. Does the generation unit has either an approved interconnection plan or submitted an application to the local distribution utility company requesting permission for an interconnection?
The application has been submitted on Nov 30th, 2016. It was received on Dec 5th, 2016.

d. Provide a single line electrical distribution and interconnection diagram.
In the Interconnection Package

7. METERING

Provide the following information for each meter of the CHP facility. Include locations for all meters on process flow diagram.

a. Fuel Meters for HRSGs and Aux Boilers

i. Meter Type: Coriolis Flow Meter
ii. Manufacturer: Rosemount
iii. Model:
iv. Is it a revenue grade meter?
v. What is the guaranteed accuracy (in %) of the meter?

b. Fuel Meter for Turbines

vi. Meter Type: Mass Flow Meter
vii. Manufacturer:
viii. Model:
ix. Is it a revenue grade meter?
x. What is the guaranteed accuracy (in %) of the meter?

c. BTU Meters

i. Meter Type
ii. Manufacturer
iii. Model
iv. Is it a revenue grade meter?
v. What is the guaranteed accuracy (in %) of the meter?

d. Steam Meters

i. Meter Type: Steam Flow Transmitter with orifice, 3-way valve
ii. Manufacturer: Rosemount
iii. Model:
iv. Is it a revenue grade meter?
v. What is the guaranteed accuracy (in %) of the meter?

e. Electric Meters

i. Meter Type
ii. Manufacturer
iii. Model
iv. Is it a utility grade meter? (i.e. in compliance with paragraph B of rule 4901:1-10-05 of the Ohio Administrative Code) Yes
v. What is the guaranteed accuracy (in %) of the meter?

Ohio | Public Utilities Commission

Application to Commit Combine Heat and Power System (Mercantile Customers Only)

Case No.: 17 -0043- EL-EEC

State of Florida :

Philippe Auge, Affiant, being duly sworn according to law, deposes and says that:

1. I am the duly authorized representative of:

   Sotel America Corp.

   (insert customer or EDU company name and any applicable name(s) doing business as)

2. I have personally examined all the information contained in the foregoing application, including any exhibits and attachments. Based upon my examination and inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete.

CFO

Signature of Affiant & Title

Sworn and subscribed before me this 10 day of April, 2017 Month/Year

Signature of official administering oath

Jorge A. Altieri

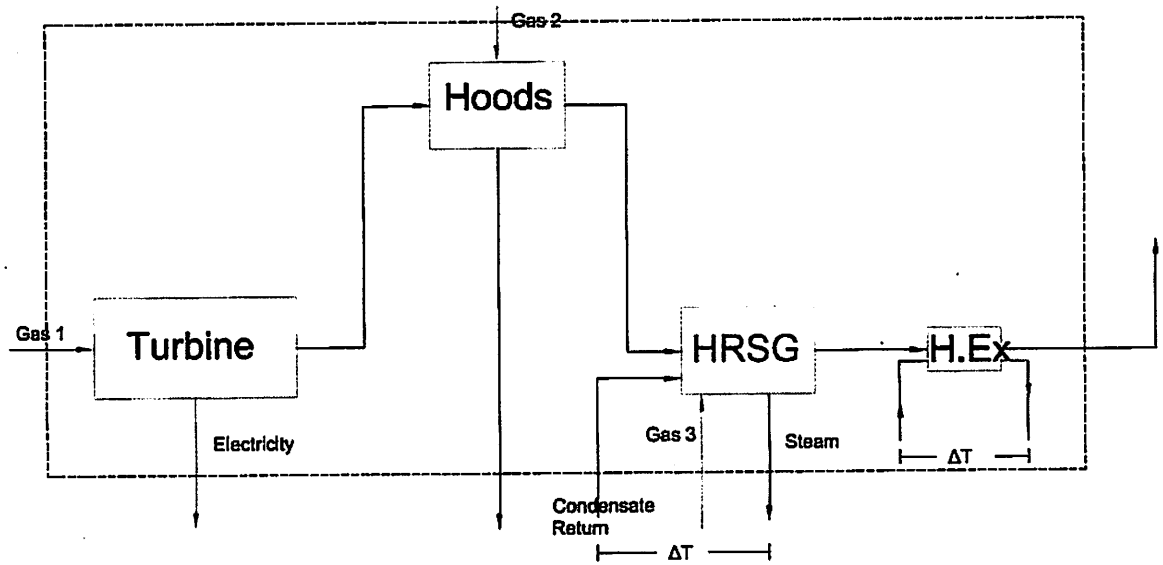
Print Name and Title

My commission expires on February 7, 2018

JORGE A. ALTIERI
Notary Public - State of Florida
My Comm. Expires Feb 7, 2018
Commission # FF 074746

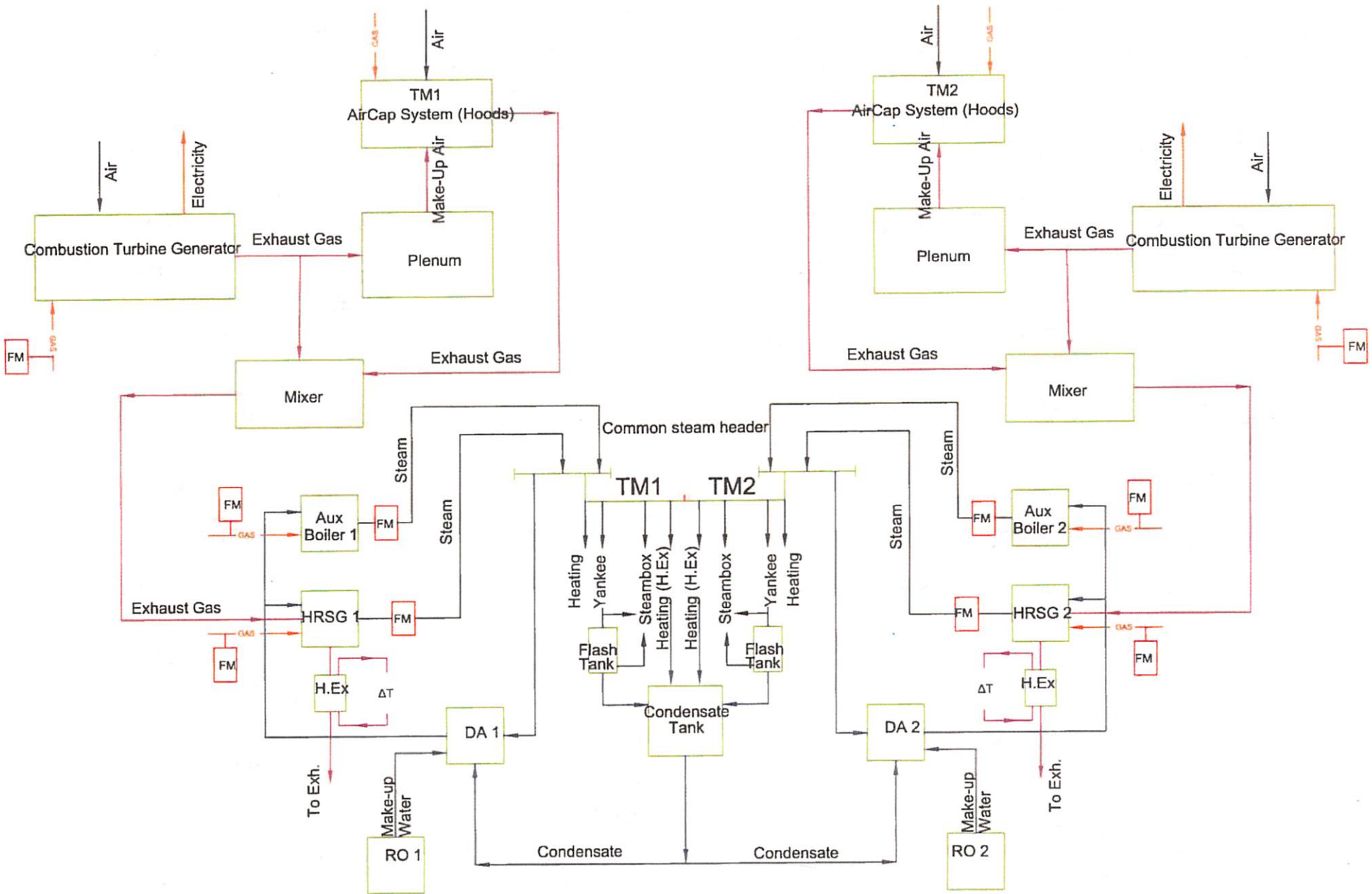
EXHIBIT 1

ATTACHMENT 1


Gas 2
Hoods
Gas 1
Turbine
HRSG
H.Ex
Electricity
Gas 3
Steam
ΔT
Condensate
Return
ΔT

Efficiency	8520	h				
COGEN OFF and paper mill running	240	h				
PCI gas Valmet	33914	kJ/Nm3	36	MJ/Sm3	10.02	kWh/Sm3
PCI gas Columbia	35.68	MJ/Sm3				
	9.99	kWh/Sm3				
Enthalpy Steam 18 bar	2,795	KJ/kg-vap	→	2419.241	KJ/kg-vap product	
Enthalpy Condensate 1 bar	417.51	KJ/kg-cond				
Enthalpy Steam 1 bar	743	KJ/kg-vap				
Boiler efficiency	0.84					
Tot. Electricity	10,000.00	kW				

	T70						
Grade	**Plein 14**	**Plein 16,5**	**Plein 35**	**Text 14**	**Text 16,5**	**Text 19**	
ADTPD	181.80	214.30	296.60	163.70	192.90	200.50	**ton/day**
Steam to Yankee	7,130.00	8,855.00	8,855.00	7,475.00	7,475.00	7,475.00	**kg/h**
Steam to Box	2,273.00	2,679.00	3,708.00	2,046.00	2,411.00	2,506.00	**kg/h**
Total steam	9,403.00	11,534.00	12,563.00	9,521.00	9,886.00	9,981.00	**kg/h**
Tot steam	18,937.21	23,411.91	24,176.09	19,603.27	19,874.33	19,944.88	MJ/h
Tot gas for steam	631.85	781.15	806.64	654.07	663.11	665.47	Sm3/h
Tot gas for steam (normal conditions)	762.52	762.52	762.52	762.52	762.52	762.52	**Sm3/h**
Tot gas for steam	6,312.40	7,803.97	8,058.70	6,534.42	6,624.78	6,648.29	kW
Tot gas for steam Valmet	6,300.00	7,728.00	8,417.00	6,379.00	6,624.00	6,688.00	**kW**
HP steam COG ON from recovery boiler	4,210.00	4,180.00	3,280.00	3,200.00	3,330.00	3,290.00	**kg/h**
	3,922.32	3,894.37	3,055.87	2,981.33	3,102.45	3,065.18	kW
Gas for missing HP steam COG ON-gasBoiler	1,956.00	3,132.00	3,735.00	2,864.00	2,777.00	2,804.00	**kW**
Gas for hood burners COG OFF	4,928.00	5,015.00	7,500.00	5,898.00	7,455.00	7,455.00	**kW**
Gas for burners COG ON	0.00	0.00	1,354.00	0.00	1,444.00	1,348.00	**kW**
Tot Electricity	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	**kW**
Electricity produced	7,518.00	7,518.00	7,518.00	7,518.00	7,518.00	7,518.00	**kW**
Δ Electricity	-2,482.00	-2,482.00	-2,482.00	-2,482.00	-2,482.00	-2,482.00	**kW**
Gas for turbine @15C/59F	22,033.09	22,033.09	22,033.09	22,033.09	22,033.09	22,033.09	**kW**
Gas for turbine (normal conditions @ 15C)	22,598.63	22,598.63	22,598.63	22,598.63	22,598.63	22,598.63	**kW**
Co-Gen Efficiency	76.4%	79.0%	83.3%	78.4%	80.5%	80.8%	79.7%


TM1
AirCap System (Hoods)
Air
GAS
Make-Up Air
Plenum
Air
Electricity
Combustion Turbine Generator
Exhaust Gas
FM
GAS
Mixer
Exhaust Gas
TM2
AirCap System (Hoods)
Air
GAS
Make-Up Air
Plenum
Electricity
Air
Exhaust Gas
Combustion Turbine Generator
GAS
FM
Exhaust Gas
Mixer
Common steam header
Steam
Steam
TM1
TM2
Steam
FM
GAS
Aux Boiler 1
FM
Heating
Yankee
Steambox
Heating (H.Ex)
Heating (H.Ex)
Steambox
Yankee
Heating
Steam
FM
Aux Boiler 2
FM
GAS
Exhaust Gas
HRSG 1
FM
GAS
FM
Flash Tank
Flash Tank
FM
HRSG 2
GAS
FM
H.Ex
ΔT
Condensate Tank
ΔT
H.Ex
DA 1
DA 2
To Exh.
Make-up Water
RO 1
Condensate
Condensate
RO 2
Make-up Water
To Exh.

EXHBIT 2

CUSTOMER COMBINED HEAT AND POWER
ENERGY EFFICIENCY AND PEAK DEMAND REDUCTION
RESOURCE COMMITMENT AGREEMENT

This Customer Combined Heat and Power Resource ("CHP") Energy Efficiency and Peak Demand Reduction ("EE/PDR") Commitment Agreement ("Agreement") is entered into by and between Ohio Power Company ("Company") and Sofidel America. ("Customer").

In consideration of the mutual covenants, terms and conditions set forth herein, Company and Customer hereto agree as follows:

1. **Commitment:** Customer agrees to commit their prospective planned CHP System electricity generation to Company's energy efficiency and peak demand reduction requirements. CHP projects may count toward meeting energy efficiency and peak demand reduction requirements as allowed under Ohio Amended Substitute Senate Bill 310.

2. **CHP System Description:** The CHP system consists of two cogeneration plants (CHP1 and CHP2) that will mirror each other as much as possible. Each cogeneration plant will have a Solar Taurus 70 gas turbine (GT) that will exhaust into a plenum that will be used in the hoods for the paper machine drying process. The GT will have an extended duct for possible addition of a selective catalytic reduction (SCR) system.
   The exhaust from the Yankee hoods will then enter the heat recovery steam generator that will be capable of duct firing to produce steam for normal operating conditions. The auxiliary boiler will supplement the remaining necessary steam.
   In normal operation, two HRSGs and one auxiliary boiler will be running to produce the necessary steam for the two paper machines. The second auxiliary boiler will be used as a backup. The auxiliary boilers will alternate when they will be in operation.

3. **Economic Analysis:** The expected customer savings over the life of the project is $81,646,242 (present value). The cost savings is for both capacity and avoided energy charges but does not include hot water savings.

4. **CHP System Life or CHP supplier Contract Term:** 20-year CHP system life

5. **CHP System efficiency and expected % availability:** 79.7% efficiency and 100% available with the exception of unexpected downtime and maintenance.

6. **Percentage of total usage offset by the CHP system:** The plants that the CHP system will supply are new construction. Approximately 75% of the expected electrical usage (provided by electrical grid through AEP transmission/distribution lines) will be replaced by this new COGEN installation.

7. **Planned annual MWh and MW generation provided from the CHP system and counted as 100% energy and demand savings committed to AEP Ohio:** 15,000 KW; 100,000,000 kWh per year

8. **Economic Benefits:** Utility Cost Test benefit/cost ratio is 26.1. Total net benefits of this project are $158,634,298 in avoided generation and transmission costs net of Company costs. This project is highly cost effective and compares very favorably to other energy efficiency projects by delivering energy and demand savings at a significantly lower cost than typical projects and the portfolio plan as a whole.

9. **Contract Term:** 5 years

10. **Anticipated commissioning date and full scale start-up of operation that will initiate contract start date:** Full-scale COGEN plant start-up planned in March (CHP1) and October 2018 (CHP2) with both plants beginning the 12 month implementation readings on or before November 15, 2018. If start-up is delayed, Customer will communicate in writing to Company actual full scale start-up date for contract initiation.

11. **Non-energy Benefits:**

    As the largest private investment in Circleville in many years, Sofidel America's Greenfield plant will increase the local economy and surrounding areas.

    The construction of the plant itself will generate economic benefits to the surrounding area either directly with companies and/or workers involved in the construction of the plant (equipment and material suppliers, contractors, engineers) or indirectly with companies servicing the needs of these companies and workers (such as food service, hospitality, and transportation industries among others). For example, there is a plan to add a rail spur in order to facilitate shipment of finished products and receipt of materials by freight train in addition to the available trucking transportation.

    Even after construction, the local economy will benefit from the establishment of this facility. Sofidel America is committed to enroll 310 employees in the Circleville facility by 2020 and by hiring in both management and manufacturing positions. Furthermore, there will be a need of continuous services from the area. As an example, like any manufacturing facility there will be a need for repair and maintenance. This maintenance would call for skilled workers as well as for supply and manufacturing of standard and custom parts.

    Recognizing that the paper manufacturing process requires a lot of energy and has an impact on our resources, Sofidel Group strives to be as environmentally and socially sustainable as possible

and is committed to give more value in products and services by reducing the negative impact on the environment as well as people's lives, hence our motto of "Less is More". Based on this guiding principle, Sofidel continues to innovate and refine its processes. In the case of the Circleville plant, for example, it is not just reducing emissions by building the two co-generation plants but also recycling as much water as possible in our paper mill process and reducing our impact in our rivers by constructing a waste water treatment plant.

Sofidel Group has various Italian and international partners among them are UN's Global Compact initiative, WWF Climate Savers, and Médecins Sans Frontières (Doctors without Borders). In the USA, all our current branches in Sofidel America are PEFC certified, endorsed by an international organization promoting sustainable forest management.

12. **CHP system generator output measurement, reporting and auditing:** Customer at their sole cost utilizing utility grade metering and in accordance with Company specifications shall measure the generator output and provide monthly readings via e-mail to designated Company personnel. After providing reasonable notice, Company has the right to inspect and validate the meter readings of the CHP system. Company will provide Customer, upon written request, a copy of any report generated as a result of the inspection and audit. Notwithstanding the foregoing, it shall be the sole responsibility of Customer to operate, maintain, repair, and inspect the CHP system to ensure its proper working order during the entire term of the agreement. Customer shall complete an Annual Affidavit of CHP Performance, attached hereto as Attachment A. Customer hereby agrees to submit the Annual Affidavit of Performance to the Company by December 15 for the CHP systems' previous year's generation, attesting to its annual generation of energy and demand in MWhs and MW, respectively, as well as the overall system efficiency for the previous year and current condition of the CHP system.

13. **Incentives:**

    a. Payments are based on annual net metered kWh produced by the CHP system for internal plant production use. Parasitic loads will be removed from the gross metered kWh generation. If parasitic loads cannot be accurately measured by the customer, then the Department of Energy recommended default value will be used for estimating the net kWh generation.

    b. Payments = $0.007 per net kWh for 5 years capped at $400,000 per year per plant.

    c. Annual payments commencing twelve months following the formal commissioning date to full operation and are made for 5 consecutive years.

d. Estimated annual payments beginning in 2019 are $700,000 and total payments over 5 years are estimated at $3,500,000.

14. **EE/PDR rider and EE/PDR program participation:** Customer agrees to continue paying EE/PDR rider until the end of the incentive payment term in this agreement, and Customer can continue to participate in any EE/PDR programs available to them.

15. **Interconnection requirements:** Customer application for interconnection has been submitted by Company and the agreement is being prepared. This agreement is subject to Customer and Company execution of the interconnection agreement.

16. **Standby service requirements:** Customer agrees to adhere to any requirements and costs of such, if applicable.

17. **Invoicing for Incentives:** Customer shall invoice Company annually for incentives within fifteen days following the end of the twelve month period and Company receipt of the Annual Affidavit of Performance. Company shall pay all such properly submitted incentive invoices within fifteen (15) business days after receipt.

18. **Penalty:** Customer could be subject to forfeit of annual incentive payment at the sole discretion of the Company if the Annual Affidavit of CHP Performance is not submitted by the due date, monthly meter readings are not provided or reasonable requests for inspection and validation of meter readings are not allowed by the Customer. If Customer terminates early (before the 5 years), the only penalty will be the forfeit of the annual incentive for that year and any subsequent years during the 5-year term.

19. **Contacts and Notices:** Contacts for each party. All Notices relating to this contract must be effectuated in writing and sent by ordinary US mail, postage prepaid, to:

a. Customer: Andrea Wong

Process Engineer, Sofidel America
25910 US 23, Circleville, OH 43113
918-934-7994

b. Company: Jon Williams

Manager, Energy Efficiency and Demand Response
301 Cleveland Avenue, Canton, Ohio 44701
330-438-7742

20. **MODIFICATION.** No modification of this Agreement is effective unless reduced to writing, signed by both parties.

21. **SUCCESSORS AND ASSIGNS.** This Agreement shall be binding upon and inure to the benefit of the parties hereto, and their respective successors and/or assigns, but Customer shall not transfer or assign any of the rights hereby granted to any non-affiliated third-party of Sofidel SpA without the prior written consent of AEP Ohio.

22. **REGULATORY APPROVAL.** The Customer and Company have worked extensively on this project over the last year and agree that we have shown that it provides significant benefits to all customers due to its size and high cost effectiveness compared to other projects. Both parties request expedited review and approval of the agreement. This contract is dependent upon approval of a mercantile arrangement along with cost recovery including shared savings through the EE/PDR rider based on the terms of this contract by the Public Utilities Commission of Ohio (Commission) The parties agree that the goal of the agreement is to help the Customer achieve greater energy efficiency and productivity in its operations and help the Company meet its energy efficiency and peak demand reduction goals, while improving the overall cost effectiveness of goal achievement in each year.

OHIO POWER COMPANY

By: _____

Name: Jon Williams

Title: Manager, Energy Efficiency and Demand Response

Date: 4/12/17

By: _____

Name: Julia Sloat

Title: AEP Ohio President & COO

Date: 4/13/17

CUSTOMER: Sofidel America

By: _____

Name: Philippe Auge

Title: CFO

Date: 4/10/2017

EXHIBIT 2
ATTACHMENT A

Attachment A

State of Ohio: **ANNUAL AFFIDAVIT OF CHP PERFORMANCE** County of:

_____, Affiant, being duly sworn, affirmed according to law, deposes and says that:

1. I am the duly authorized representative for purposes of this agreement of the _____ CHP generating facility.
2. I have personally examined and am familiar with all information contained in the foregoing Agreement, including any exhibits and attachments, and that based upon my inquiry of those persons immediately responsible for obtaining the information contained in the Agreement; I believe that the information is true, accurate and complete.
3. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

The Statement:
For the twelve month period identified by the Meter Read Dates below, this CHP generating facility continued to be in good working order with no material corrective actions pertaining to safety and/or operation warranting major attention and significant down time. Further, this CHP generating facility delivered_____MWhs in the twelve month period.

Meter Read Dates (mo/day/yr)	Readings
Start: _____	_____
End: _____	_____

The calculated average annual total system efficiency for the twelve month period of the CHP generating facility is_____%

_____

Signature of Affiant & Title

Sworn and subscribed before me this____day of _____,_____Month/Year

_____ _____

Notary Signature Print Name and Title

My commission expires on _____

Exhibit 3

Cost Benefit Analysis

Test	NPV	Benefit/ Cost Ratio
Total Resource	$ 46,578,961	2.7
Participant	$ 67,889,109	3.5
RIM	$ (21,310,148)	0.8
Utility	$ 70,745,760	26.1
Societal	$ 78,897,344	3.9

NPV/kWh	$	0.7075
Shared Savings per kWh	$	0.0920
Shared Savings	$	9,196,949

EXHBIT 4

AEP OHIO
A unit of American Electric Power

APPLICATION FOR INTERCONNECTION OF GENERATION EQUIPMENT 20 MEGAWATTS OR LESS (Standard Form Application)

A Short Form Application is available for inverter-based systems (25 kW or less).

An Application is a complete application when it provides all applicable and correct information required below. Additional information to evaluate a request for interconnection may be required pursuant to the application process after the Application is deemed complete.

Applications for Interconnection meeting Level 2 qualifying criteria are subject to an application fee of $50 + $1/kW. Applications for Interconnection meeting Level 3 qualifying criteria are subject to an application fee of $100 + $2/kW. Check Attached

Customer

Legal Name: Sofidel America

Mailing Address: 25910 US 23

City: Circleville State: OH Zip: 43113

Phone: (863) 512-3829 Phone: (___) ___

E-mail address: simone.capuano@sofidel.it

Alternate Contact

Name: Andrea R. Wong

Mailing Address: 25910 US 23

City: Circleville State: OH Zip: 43113

Phone: (918) 934-7994 Phone: (___) ___

E-mail address: andrea.wong@sofidelamerica.com

Facility Location

Street Address: 25910 US 23

City: Circleville Zip: 43113

Service Information

Electric Service Account Number: 106-846-664-0

Existing Electric Service: Capacity: 1200 Amperes Voltage: 138,000 Volts

Service Character: ( ) Single Phase (X) Three Phase

Site Maximum Demand: 20,000 kW Annual Energy Consumption 122,640,000 kWh

Requested Point of Interconnection: SEL 351-7 relays (main breakers at Sofidel's substation)

Location of Utility Accessible Lockable Disconnect Switch: At AEP Substation N/E of Sofidel Property, North of utility meter (e.g. West wall next to utility meter)

Requested In-Service Date: Nov 15, 2017

Consulting Engineer or Contractor

Name: Concord Engineering Group

Address: 520 S Burnt Mill Road

City: Voorhees State: NJ Zip: 08043

Phone: (856) 427-0200 Phone: (609) 760-4052 E-mail: gmolinari@concord-engineering.com

Generator Qualifications

Energy Source: ( ) Solar ( ) Wind ( ) Hydro: type (e.g. run-of-river) _____

( ) Diesel (X) Natural Gas ( ) Fuel Oil ( ) Other: (specify)_____

Type of Generator: ( ) Inverter-Based (X) Synchronous ( ) Induction

Generator Nameplate Ratings: 7518 kW @ 59F, 12470 Volts Connected (X) Wye ( ) Delta

Number of Generators: 2 Service Character: ( ) 1 Phase (X) 3 Phase Power Factor: 80%

Inverter AC Ratings: N/A kW _____ Volts Number of Inverters _____

Number of Solar PV Modules: N/A DC Rating: _____ watts

Maximum Net Export Capability: 6 MW Estimated Annual Energy Production: 50,000 mWh (Expected)

Will trip with reverse power relay if exporting more than 6 MW after a period of time

This Generating Equipment is intended to be used to:

( ) Emergency/Standby – Operated when AEP service is not available. Paralleling is for short durations.

( ) Peak Shaving – Operated during peak demand periods. Paralleling is for extended times.

( ) Base Load Power – Operated continuously at a pre-determined output. Paralleling is continuous.

(X) Cogeneration – Operated primarily to produce thermal energy. Paralleling is extended or continuous.

( ) Renewable non-dispatched – Operated in response to an available renewable resource. Paralleling is for extended times.

( ) Other – Describe: _____

List components of the generation equipment that are currently certified by a nationally recognized testing and certification laboratory (NRTL) and/or listed by the Underwriters Laboratory:

Equipment Type	UL Listing or certifying NRTL Certification
1. Gas Turbine Generator Package: Solar Turbine Model - Taurus 70 Gen Set.	The components of the package are manufactured and tested inaccordance with internationally recognized standard and certified by nationally recognized testing & ceritifcation. laboratory (NRTL) and/or listed by UL (See attachment-6)

Generation Equipment Technical Information

Attach electrical one-line diagram showing the configuration of all generating facility equipment, transformers, switchgear, switches, circuit breakers, fuses, current and potential transformers, and protection and control schemes. (This diagram must be signed and stamped by a licensed Professional Engineer if the facility is larger than 50kW).

Attach site documentation that indicates the precise physical location of the proposed generating facility and location of protective interface equipment, disconnect switch, and utility electric meter (e.g. USGS topographic map or other diagram or documentation).

Attach technical specifications literature for inverters, photovoltaic modules, wind turbines, other generation equipment, battery systems, transformers, switches, or other interface devices and documentation that describes and details the operation of all protection and control schemes.

Attach UL 1741 documentation or installation test procedures for all the tests required by IEEE 1547 and the periodic maintenance schedule recommended by the equipment manufacturer.
NOTE 1
Attach "Certificate of Liability Insurance" or proof of insurance sufficient to meet construction, operating and liability responsibilities.

I hereby certify that, to the best of my knowledge, all the information provided in the Interconnection Application is true and correct.

CUSTOMER'S SIGNATURE: Steve Cope

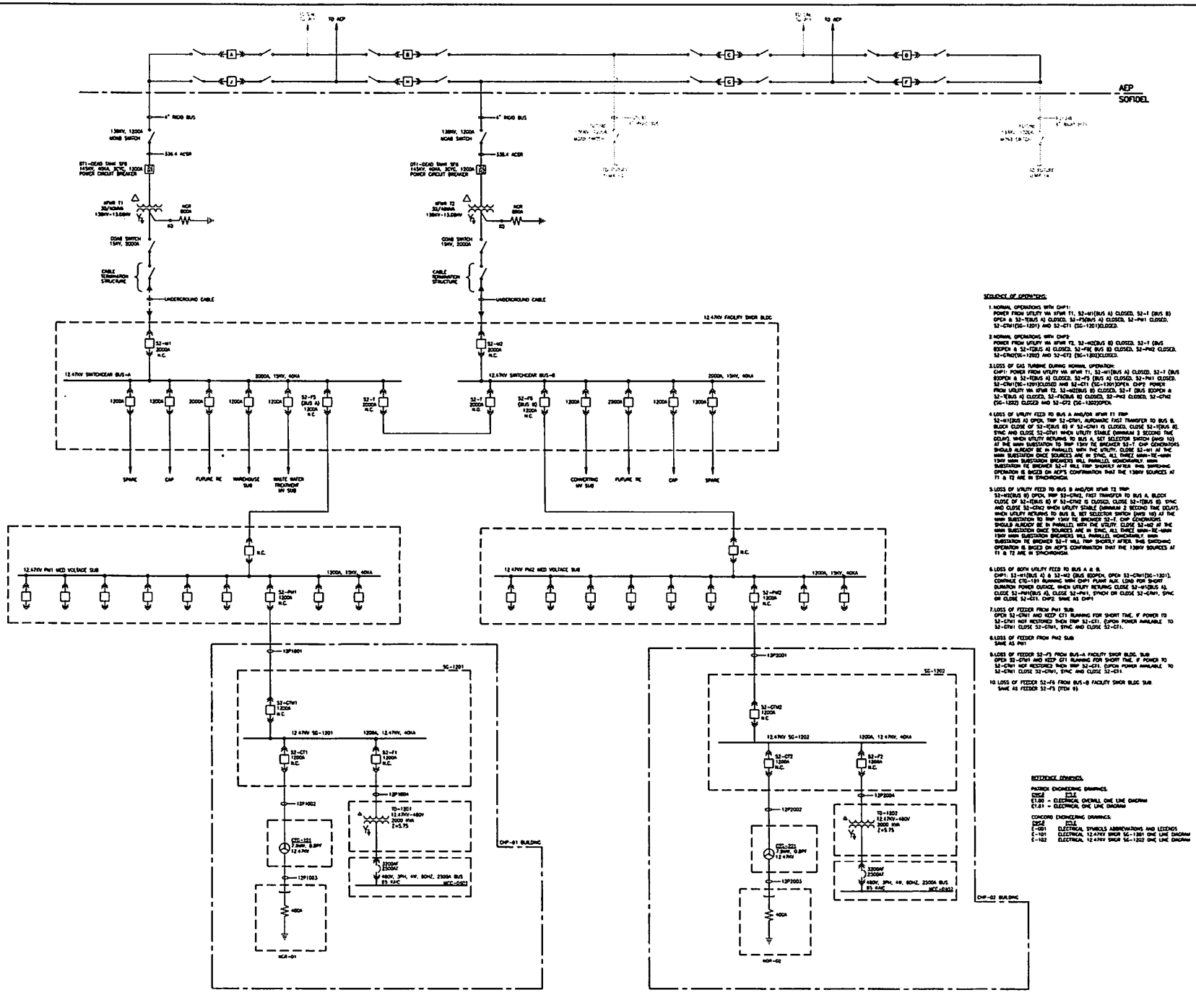
TITLE: CHIEF TECHNICAL OFFICER

DATE: 11/30/2016

Return Completed Application to: *AEP Ohio*
Attn: DG Coordinator
850 Tech Center Dr
Gahanna, Ohio 43230-6605
614-883-6775
dgcoordinator-ohio@aep.com

Attachment:
1. Electrical: Overall One Line Diagram: E100/0 - 11/22/16
2. Electrical: One Line Diagram: E1.01 - 11/22/16
3. Electrical 12.47kV SWGR SG 1201 One Line Diagram: E101/0 - 11/22/16
4. Electrical 12.47kV SWGR SG 1202 One Line Diagram: E102/0 - 11/22/16
5. Site General Arrangement Drawing
6. Solar Turbine Technical Specification - June 20, 2016: Rev 1
7. Certificate of Liability Insurance

Note 1: The Installation tests will be carried out in acccordance with 1EEE1547 and the specific procedure will be forwarded on appoval of the application.



CLIENT:

SOFIDEL America

CONCORD ENGINEERING

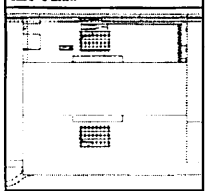
P.A. 24OA27636700

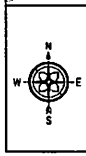
Pride, Business License No. 107707

0	02/02/2016	ISSUED FOR AEP REVIEW
No.	Date	Description

REVISIONS:

KEY PLAN:





NOT FOR CONSTRUCTION

Professional Engineer

PROJECT:

SOFIDEL AMERICA TORNADO
Combined Heat & Power Plant
Schematic Design Package

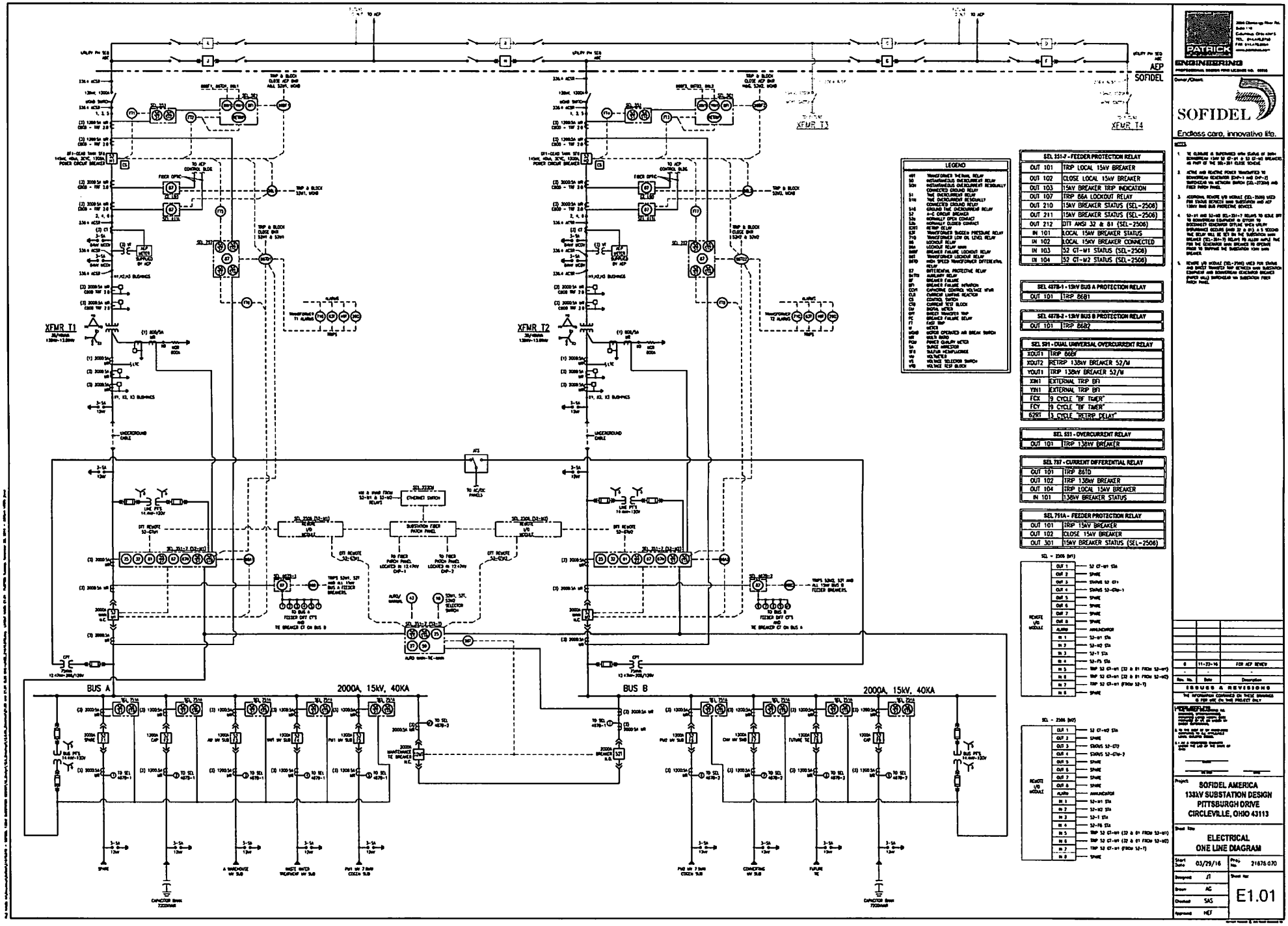
SOFIDEL AMERICA

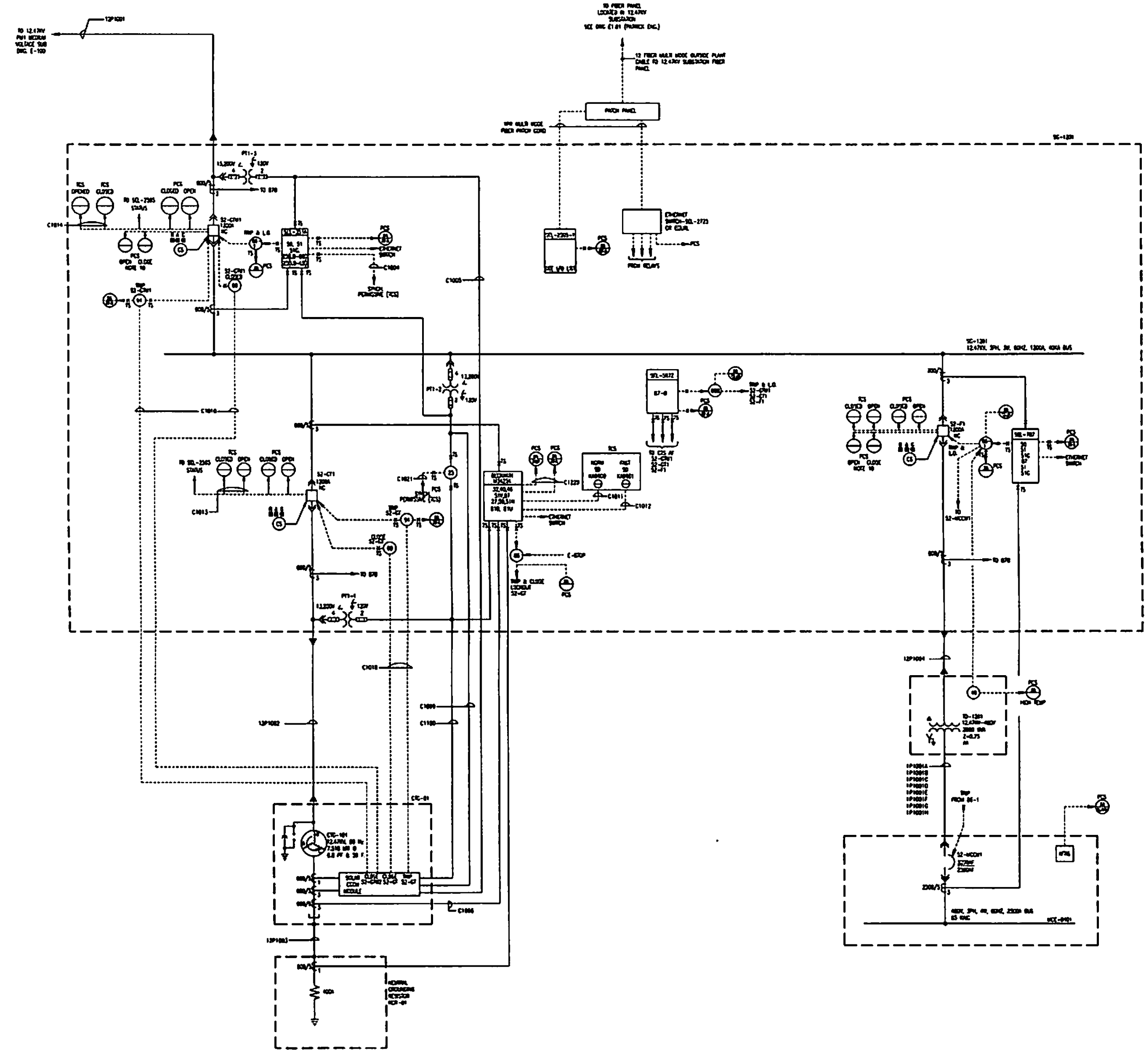
CIRCLEVILLE, OH 43113

DRAWING TITLE:

ELECTRICAL
OVERALL ONE LINE DIAGRAM

DRAWN BY	PL	SCALE	AS NOTED
CHECKED BY	DS	DRAWING NO	REVISION
DATE	02/16/2016	E-100	0
PROJECT NO.	2016071.00		


AEP
SOFIDEL
XFMR T1
XFMR T2
BUS A
BUS B
2000A, 15kV, 40KA
2000A, 15kV, 40KA
LEGEND
SEL 351-7 - FEEDER PROTECTION RELAY
OUT 101 TRIP LOCAL 15kV BREAKER
OUT 102 CLOSE LOCAL 15kV BREAKER
OUT 103 15kV BREAKER TRIP INDICATION
OUT 107 TRIP 86A LOCKOUT RELAY
OUT 210 15kV BREAKER STATUS (SEL-2506)
OUT 211 15kV BREAKER STATUS (SEL-2506)
OUT 212 DTI ANSI 32 & 81 (SEL-2506)
IN 101 LOCAL 15kV BREAKER STATUS
IN 102 LOCAL 15kV BREAKER CONNECTED
IN 103 52 GT-M1 STATUS (SEL-2506)
IN 104 52 GT-M2 STATUS (SEL-2506)
SEL 4378-1 - 15kV BUS A PROTECTION RELAY
OUT 101 TRIP 86B1
SEL 4378-2 - 15kV BUS B PROTECTION RELAY
OUT 101 TRIP 86B2
SEL 501 - DUAL UNIVERSAL OVERCURRENT RELAY
XOUT1 TRIP 86BF
XOUT2 RETRIP 138kV BREAKER 52/M
YOUT1 TRIP 138kV BREAKER 52/M
XIN1 EXTERNAL TRIP BF1
YIN1 EXTERNAL TRIP BF1
FCX 9 CYCLE "BF TIMER"
FCY 9 CYCLE "BF TIMER"
62RT 3 CYCLE "RETRIP DELAY"
SEL 551 - OVERCURRENT RELAY
OUT 101 TRIP 138kV BREAKER
SEL 787 - CURRENT DIFFERENTIAL RELAY
OUT 101 TRIP 86TD
OUT 102 TRIP 138kV BREAKER
OUT 104 TRIP LOCAL 15kV BREAKER
IN 101 138kV BREAKER STATUS
SEL 751A - FEEDER PROTECTION RELAY
OUT 101 TRIP 15kV BREAKER
OUT 102 CLOSE 15kV BREAKER
OUT 301 15kV BREAKER STATUS (SEL-2506)
SEL - 2506 (#1)
SEL - 2506 (#2)
PATRICK ENGINEERING
SOFIDEL
Endless care, innovative life.
0 11-22-16 FOR AEP REVIEW
ISSUES & REVISIONS
SOFIDEL AMERICA
138kV SUBSTATION DESIGN
PITTSBURGH DRIVE
CIRCLEVILLE, OHIO 43113
ELECTRICAL
ONE LINE DIAGRAM
Start Date 03/29/16
Proj. No. 21678.070
Designed JT
Drawn AC
Checked SAS
Approved MEF
E1.01



QUALIFIER NOTE

THIS ONE LINE DIAGRAM REPRESENTS THE PRELIMINARY CONCEPT OF INTERCONNECTION OF THE CHP GENERATORS WITH THE OVERALL PLANT DISTRIBUTION SYSTEM. THE PROTECTION, METERING, CONTROL AND MONITORING SYSTEM SHOWN IS BASED ON TYPICAL APPLICATION. THE SYSTEM MAY REQUIRE UPDATE/REVISION IN COORDINATION WITH THE PLANT OPERATING PHILOSOPHY AND THE UTILITY INTERCONNECTION REQUIREMENTS.

LEGEND

PCS STATUS (INPUT)

PCS CONTROL (OUTPUT)

MULTI FUNCTION METER

TS - TEST SWITCH

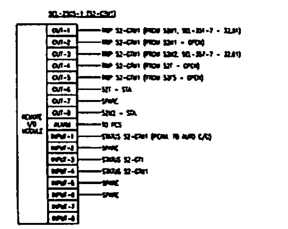
RFA - RELAY FAILURE ALARM

NGR NEUTRAL GROUNDING RESISTOR

PCS PLANT CONTROL SYSTEM

TCS SOLAR TURBINE CONTROL SYSTEM

AFRS ARC FLASH REDUCTION SWITCH



DRAWING NOTES:

1. REFER TO DRAWING E-001 FOR ELECTRICAL SYMBOLS, ABBREVIATIONS LEGEND, AND GENERAL NOTES.
2. THE VOLTAGE REACHES A POSITIVE MAXIMUM AT THE GENERATOR TERMINALS IN THE ORDER OF A, B, C.
3. REFER TO PROJECT CABLE SCHEDULE FOR ALL CABLE AND CONDUIT INFORMATION.
4. REFER TO DRAWING E-100 FOR OVERALL SITE SINGLE LINE.
5. SEL-2365 FURNISHED BY SWITCHGEAR MANUFACTURER.
6. 125 VDC FROM SWITCHGEAR BATTERY SYSTEM SHALL BE USED FOR PROTECTIVE RELAYS AND I/O REQUIRING AUXILIARY POWER.
7. UNLESS INDICATED OTHERWISE BREAKER STATUS CONTACTS (52a AND 52b MOC AND TOC), 4 EACH SHALL BE WIRED OUT TO TERMINAL BLOCKS FOR USE WITH THE PLANT CONTROL SYSTEM AND THE TURBINE CONTROL SYSTEM.
8. ALL LINE AND BUS POTENTIAL CIRCUITS SHALL BE WIRED OUT TO TERMINAL BLOCKS FOR THE CUSTOMERS USE.
9. TEST SWITCHES SHALL BE PROVIDED FOR ALL TRIP, PT, AND CT CIRCUITS (ABB FT1 OR EQUAL).
10. THE PCS CLOSE AND OPEN COMMANDS SHALL BE WIRED THROUGH INTERPOSING RELAY AT SWITCHGEAR.

CLIENT:

SOFIDEL America

CONCORD ENGINEERING

REVISIONS:

KEY PLAN:

NOT FOR CONSTRUCTION

Professional Engineer

PROJECT:

SOFIDEL AMERICA TORNADO
Combined Heat & Power Plant
Schematic Design Package

SOFIDEL AMERICA

CIRCLEVILLE, OH 43113

DRAWING TITLE:

ELECTRICAL
12.47KV SWGR SG-1201
ONE LINE DIAGRAM
CHP-01 BUILDING

SCALE: AS NOTED

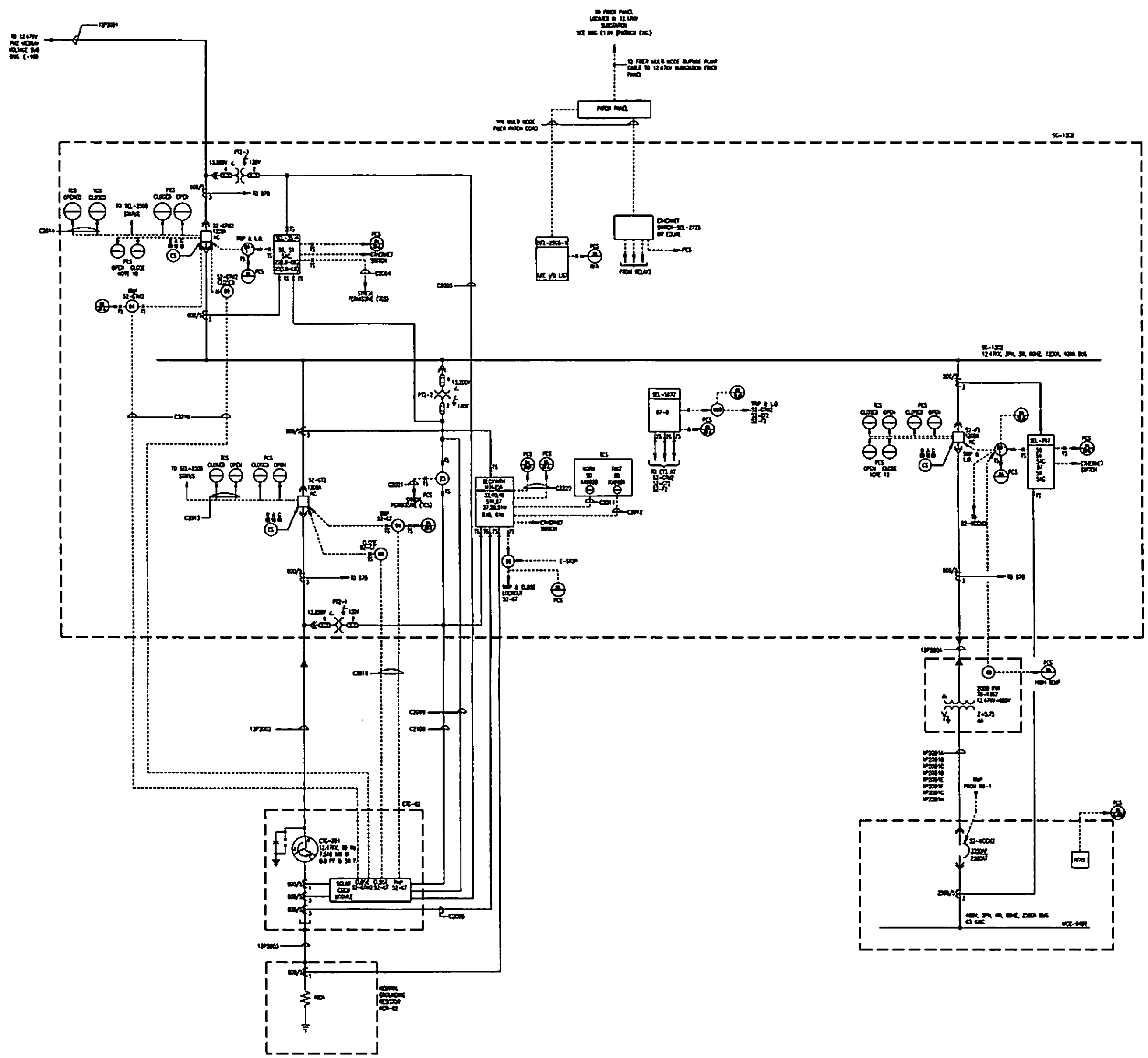
DRAWING NO. E-101

REVISION 0

CLIENT:

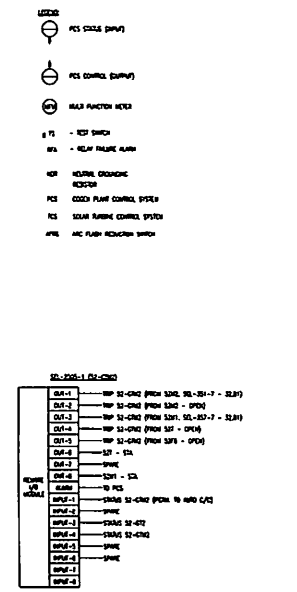
SOFIDEL America

CONCORD ENGINEERING



QUALIFIER NOTE

THIS ONE LINE DIAGRAM REPRESENTS THE PRELIMINARY CONCEPT OF INTERCONNECTION OF THE CHP GENERATORS WITH THE OVERALL PLANT DISTRIBUTION SYSTEM. THE PROTECTION, METERING, CONTROL AND MONITORING SYSTEM SHOWN IS BASED ON TYPICAL APPLICATION. THE SYSTEM MAY REQUIRE UPDATE/REVISION IN COORDINATION WITH THE PLANT OPERATING PHILOSOPHY AND THE UTILITY INTERCONNECTION REQUIREMENTS.



DRAWING NOTES:

1. REFER TO DRAWING E-001 FOR ELECTRICAL SYMBOLS, ABBREVIATIONS LEGEND AND GENERAL NOTES.
2. THE VOLTAGE REACHES A POSITIVE MAXIMUM AT THE GENERATOR TERMINALS IN THE ORDER OF A, B, C. (NEED VERIFICATION)
3. REFER TO PROJECT CABLE SCHEDULE FOR ALL CABLE AND CONDUIT INFORMATION.
4. REFER TO DRAWING E-100 FOR OVERALL SITE SINGLE LINE.
5. SEL-2505 FURNISHED BY SWITCHGEAR MANUFACTURER.
6. 125 VDC FROM SWITCHGEAR BATTERY SYSTEM SHALL BE USED FOR PROTECTIVE RELAYS AND I/O REQUIRING AUXILIARY POWER.
7. UNLESS INDICATED OTHERWISE BREAKER STATUS CONTACTS (52a AND 52b NOC AND TOC), 4 EACH SHALL BE WIRED OUT TO TERMINAL BLOCKS FOR USE WITH THE PLANT CONTROL SYSTEM AND THE TURBINE CONTROL SYSTEM.
8. ALL LINE AND BUS POTENTIAL CIRCUITS SHALL BE WIRED OUT TO TERMINAL BLOCKS FOR THE CUSTOMERS USE.
9. TEST SWITCHES SHALL BE PROVIDED FOR ALL TRIP, PT, AND CT CIRCUITS (ABB FT1 OR EQUAL)
10. THE PCS CLOSE AND OPEN COMMANDS SHALL BE WIRED THROUGH INTERPOSING RELAY AT SWITCHGEAR.

REVISIONS:

KEY PLAN:

Professional Engineer

PROJECT:

SOFIDEL AMERICA TORNADO
Combined Heat & Power Plant
Schematic Design Package

SOFIDEL AMERICA

CIRCLEVILLE, OH 43113

DRAWING TITLE:

ELECTRICAL
12.47KV SWGR SG-1202
ONE LINE DIAGRAM
CHP-02 BUILDING

DRAWING NO. E-102

REVISION 0

Summary: Application Joint application for approval of a special arrangement agreement between Ohio Power Company and Sofidel America electronically filed by Mr. Steven T Nourse on behalf of Ohio Power Company