

# Cuyahoga County – RFI for Public Utilities and Microgrids

July 15, 2022

Cuyahoga County Department of Sustainability 2079 East 9<sup>th</sup> Street – 8<sup>th</sup> Floor Cleveland, OH 44115

Attention: Mr. Mike Foley Director, Department of Sustainability

Subject: Request for Information for Public Utilities and Microgrids

Dear Mr. Foley,

Nexus Engineering Group (Nexus) is pleased to offer the following information for utility microgrid development services. Headquartered in downtown Cleveland, just a few blocks from Cuyahoga County's downtown office location, Nexus is co-owned by Ms. Marianne Corrao (50%) and Mr. Jeff Herzog (50%). Since 2005, Nexus has built a multidisciplined and diversified team of over 200 engineers, project managers, project controls staff, construction administrators, and other professional service providers. Nexus is local, so our responsiveness will be immediate and seamless with your project team.

The Energy Group at Nexus is uniquely qualified to be a strong asset to Cuyahoga County fulfilling all technical, management, and administrative requirements. Nexus team members have direct experience with the County in the recent Cleveland Microgrid District RFQ/RFP development and solicitation. Our team of experienced professionals have hundreds of years of combined experience in distributed energy, distributed generation, substation, transmission and distribution engineering and construction. Most recently with the advent of Microgrids, our team has been involved on numerous microgrid related projects, which include microgrid distributed generation and control system assets. Our team has regularly interfaced with the local electric utilities serving the county, as well as the regional transmission authority PJM. As so, we feel uniquely qualified to assist Cuyahoga County in developing a portfolio of microgrid projects, providing input in the preparation of the developer RFQ/RFP's, and assisting the county as its technical representative through the implementation phase.

<u>Nexus would like to offer our services in an Owner's Engineer capacity.</u> Although we are fully capable and experienced to provide the conceptual and detailed design engineering for your planned Distribution Infrastructure, Distributed Generation, and/or Microgrids projects; we believe we can be of highest value to the County in being the County's Owner's Engineer reviewing and approving design concepts and detailed engineering performed by your contracted DBOOM project developers. As so, in addition to traditional Owner's Engineer roles, Nexus experience with both electric utility infrastructure and DG/Microgrids will allow us to provide the County upfront conceptual input as projects are developed, project controls cost estimating and scheduling, as well as construction observation as they are built and put into operation.

Thank you for giving Nexus the opportunity to submit our information. Headquartered in downtown Cleveland, and our staff residing throughout the Cuyahoga County region, we have a personal interest and commitment to this program's success and the benefits it will provide environmentally and economically to the region. We look forward to your favorable review and discussing further our participation and role in the Cuyahoga County's microgrid utility program.

Respectfully submitted,

NEXUS ENGINEERING GROUP, LLC

Martin F Ellman

Martin F. Ellman, P.E., CEM, DGCP Project Director – Power & Energy Nexus Engineering Group, LLC. 1422 Euclid Ave., Suite 1400 Cleveland, OH 44115

Attachments: Nexus Brochure







Nexus Engineering Group is a full-service, independent engineering firm focused on supporting clients' specific project goals, from concept to startup. With fifteen years of proven engineering and design successes and a growing team with more than 200 professionals that you will enjoy working with, Nexus is more than your typical engineering firm. Clients come to us for our expertise, creativity, passion, and relentless focus on their goals.

Business Case Development & Front-End Loading

**Engineering & Detail Design** 

**Project Services & Controls** 

Construction, Commissioning, Outage & Turnaround Support

### Energy

Our energy services offerings for power delivery (T&D) and distributed generation includes substation engineering, power systems analysis, and plant system design and maintenance solutions. Focused on medium and high-voltage applications up to 345kV, our industry-seasoned staff brings a wealth of project and system experience to develop safe, comprehensive solutions.

### Renewables

Our experience includes working directly for clients in the renewable, biofuel, and green energy industry to provide process and project management expertise, helping integrate power from renewable sources into their existing operations, and consulting to vet sustainability investments, provide the economic analysis needed to project return on investment, and implement smart solutions. Nexus's process expertise makes us a trusted partner in designing more efficient facilities and processes that reduce carbon emissions and operational costs.

### **Oil Refining**

Nexus brings a rare combination of technical skill and practical knowledge gained from years working with refining clients to help improve productivity and safety while meeting environmental standards. Our understanding of the refining business and its operational complexity helps us deliver quality, pragmatic designs that work.

### Petroleum Midstream

Nexus professionals have the resources, skill and expertise to manage midstream projects and provide operational support for the processing, separation, storage, and distribution of natural gas, liquid petroleum gas, liquid natural gas, crude oil, and crude oil components.

### Chemicals

Nexus offers full-service project design that drives efficiency, productivity, and improved quality and plant safety for specialty and commodity chemical companies. We have a deep understanding of continuous processing, solids handling, combustion, and distillation, with a proven track record in product and feedstock logistical planning and optimization.

### Manufacturing

Our broad manufacturing expertise includes installation of new process lines, rearranging equipment to maximize logistical efficiencies, and designing equipment modifications that improve productivity, product quality, and safety while minimizing manufacturing costs and production line downtime.



# **Energy Projects and Services**



#### TRANSMISSION **& DISTRIBUTION**

#### **Projects**

- Greenfield Substations (138KV and below) **Brownfield Substation** Upgrades (345KV and below) **Ring Bus Additions Circuit Breaker Replacements** & Additions **Transformer Replacements** & Additions Protection Replacements (Relay Panel, RTAC, RTU, SCADA) **Capacitor Bank Additions**
- Transmission Lines (138KV and below)

#### Services

- Protection & Control Development Single Line, Schematic, &
- Wiring Diagram Design Substation Layout & Physical
- Design Site Civil, Structural Foundation, & Bus Structure Design
- Ground Grid & Lightning Protection Design
- Capacity Assessments & Upgrade Design
- Transmission Pole Line Design (138KV and below) Underground Transmission
- Design (138KV and below)



### **POWER GENERATION**

#### **Projects**

Fossil Fuel Plant Upgrades & Maintenance Combined Heat & Power (CHP) to 100MW Cogeneration **Biogas Generation** Balance of Plant Wind Turbine Generation Solar Generation

#### Services

General Arrangement Development Process PFD & P&ID Development Mechanical System Design & **Equipment Specification** Process Piping 3D Design & Isometrics Civil & Structural Design Electrical System Design Instrumentation & Control SCADA **NERC** Compliance



### **POWER DELIVERY** & ANALYSIS

#### **Projects**

Power Distribution Systems (69KV, 34.5KV, 15KV and below) **Electrical Equipment Upgrades** & Additions Protective Device Upgrades & Additions SCADA System Upgrades & Additions

### **Services**

Single Line Diagram Development **Electrical Equipment** Specification Computer Modeling, Load Flow, Load Analyzer, Voltage Profiles Short Circuit Analysis & Device Evaluation Protection: Selectivity, Coordination, Relay Programming & Set-up Motor Starting, Transient Stability, Acceleration Analysis Harmonic Screening, DC Systems Analysis Arc Flash Analysis & Mitigation **Distribution System Physical** Design System Grounding & Earthing Design Fiber & Ethernet Network Development



### DISTRIBUTED ENERGY

#### Projects

Microgrid Development & Design Emergency Power Generators, Boilers, HRSG's Steam & Hot Water Systems Chilled Water Systems Energy Storage Uninterruptible Power Waste Heat to Energy **Compressor Stations &** Pipelines Fuel Storage & Distribution Wind & Solar Generation

#### Services

**Electrical System Development** & Design Process System Development & Design Mechanical, Civil, Structural Design Control System Architecture Development

**S NEXUS**<sup>®</sup> *Orgineering relationships.* 

# You'll Want Us in Your Business.

You expect design, project management and controls expertise from an engineering design firm. What you may not expect is how our understanding of your business inspires creative approaches you hadn't considered. We call it Busineering, and it's how we ensure every engagement begins with our team learning your business objectives, not just your engineering needs.

We start by studying your operations, investment and desired outcome, which helps us evaluate the engineering problem from all angles. Then Nexus gets to work on how to best maximize your return. Business-first thinking inspires more creative design, and more effective communications throughout the project.

From project kickoff to closeout, we work hard to become the trusted partner you'll want to come back to for the next project or investment program. Our high-energy staff is made up of talented process, instrumentation and controls, structural, electrical, mechanical, and piping professionals with decades of hands-on conceptual and detailed system design, construction, commissioning and turnaround support, and project management experience. What we all have in common—a shared commitment to building engineering relationships that last for careers.



**Cleveland** Nexus Engineering Group, LLC. 1422 Euclid Ave., Suite 1400 Cleveland, OH 44115 Engineering, relationships.

**Toledo** 480 W. Dussel Dr #250 Maumee, OH 43537 Houston 3663 N Sam Houston Pkwy E #600 Houston, TX 77032

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Connect with Nexus:





Martin F. Ellman, P.E., CEM, DGCP Project Director Power & Energy

Mr. Ellman has thirty-five years of power and energy consulting engineering experience and is currently responsible for business development, client account P&L, project management of engineering and construction projects, and management supervision of associated staff. He is a registered professional engineer, certified energy manager, and distributed generation certified professional, specializing in power systems, control systems, and energy projects. He has worked with clients in various industries which include utilities, industrial, institutional, manufacturing, and process, from project development through start-up. Projects have included utility substation design, transmission, power generation, power distribution, cogeneration, combined heat & power systems, SCADA data acquisition systems, and facility PLC/DCS systems. Mr. Ellman is passionate in advancing energy technology and working to make an impact on associated regional and national energy objectives.



### Education, Registration, Certification, and Memberships

BEE, Bachelor of Electrical Engineering, Cleveland State University, 1986
Professional Engineer, State of OH, MI, PA, IN, WV, VA, NY, KS, OR, MA, NC, GA, LA, FL
National Council of Examiners for Engineering and Surveying – NCEES Certified
CEM, Certified Energy Manager – AEE Certified
DGCP, Distributed Generation Certified Professional – AEE Certified
AEE, Association of Energy Engineers, Senior Member
CCPI, Cogeneration and Competitive Power Institute, Senior Member
AREDI, Alternative & Renewable Energy Development Institute, Charter Member
CES, Cleveland Engineering Society, Energy Division 2004/2005 Chair

### Experience

### 50MW Microgrid, Cleveland Microgrid District, Cleveland, OH (2019-2020)

Project manager for developing the interconnection requirements to facilitate an RFQ/RFP for a developer to finance, furnish, own, and operate an approx. 4-sq mile microgrid in the City of Cleveland Ohio. Utility interconnections consisted of a new 138KV/11.5KV 50MVA substation ring bus and various 11.5KV substation interconnections. Distributed energy resources included in the conceptual design included combined heat & power, energy storage, solar, wind, and other various forms of distributed generation assets. #

**University of Michigan Power Preservation System (PPS), RoviSys, Ann Arbor, MI** (2018-2020) Project manager on a campus microgrid addition consisting of a complete SEL control and protection solution managing the campus (7) HRSG's/Boilers and (5) Combustion/Steam Generators, 500K lb/hr, 28.5MW respectively. Services included providing Engineer of Record design oversight to the RoviSys control system design team and providing a dynamic system model/simulator for the steam, feedwater, and condensate systems using Aspentech's HYSYS software. Simulation was performed in tandem with an SKM electrical power system model, and facility DCS system to simulate behavior and responses of continuous and transient operations, including boiler, turbine, and system trips, and the PPS's ability to maintain a fully operational and resilient system. #

# T&D Infrastructure Replacements, FirstEnergy, OH, PA, NJ, WV (2015-2020)

Project manager in charge of a team of project managers and design personnel performing various high voltage substation 345KV, 138KV, 69KV, 34.5KV improvement projects, assisting FirstEnergy and its PMO representative Burns & McDonnell in implementing their Engineering the Future Program (EtF). #

## 138KV Expansion Project, Cleveland Public Power, Cleveland OH (2003-2020)

Project manager in charge of a team of project managers and design personnel performing various high voltage substation improvement projects to increase the capacity and reliability of the CPP substation and transmission system. #

# Combined Cycle Cogeneration Facility, City of Toledo, Toledo, OH (2004-2010)

Project manager for a 10 MW combined cycle cogeneration facility. Responsible for architecture, engineering and construction management of building additions, gas compressors, combustion turbine and generator, heat recovery steam generator (HRSG), steam turbine and generator, paralleling switchgear and control, and facility PLC/HMI control system / SCADA. #

# Emergency Power Facility, PGRD, Kalamazoo, MI (2004-2005)

Project manager for a standalone 12MW emergency power generation facility located adjacent to and interconnected with the facilities 46KV/13.8KV primary utility substation. The facility was designed to provide 12MW, 13,800VAC rated generation and consists of six 2.0 MW generators capable of facility black start, island mode and utility load share. #

# Icebreaker Windpower, LEEDCo/FORUSA, Cleveland, OH (2016)

Project manager for a six turbine 20MW wind farm 8-miles north of Cleveland Ohio in Lake Erie., the first planned fresh water offshore wind farm in North America. Responsible for the design of infrastructure additions at the onshore interconnection substation, which included a 138KV ring bus addition. #

## Renewable Energy Facility, NEORSD, Cleveland, OH (2010-2014)

Project manager in charge of control system team integration, budget, schedule management, and QAQC providing Programming System Integration Management (PSIM) services for the \$150M facility. #

# Utility Interruption Study, Medical Center Company, Cleveland, OH (2015)

Project manager on a utility system capacity assessment of the University Circle steam, chilled water, and electrical loads. Load and interruption analysis were performed for N-1 failure scenarios to determine the systems ability to support summer and winter loads, as well as determine potential upgrades to increase reliability and resiliency. *#* 

# Energy Center Addition, Radford Army Ammunition Facility, ESG/BAE, Radford, VA (2018-2020)

Project manager for the performance of an Independent Technical Review (ITR) of the Energy Systems Group design of an energy center addition consisting of 30MW combustion turbine/HRSG additions, 12MW of reciprocating diesel engine emergency generator additions, and a 3-day operational fuel storage facility. In addition, responsible for the development of a detailed facility commissioning plan including testing and schedule sequencing. #

# 50MW Cogeneration Facility, United Refining, Warren, PA (2012)

Project manager for a conceptual engineering study and preliminary engineering design consisting of a 50MW combustion gas turbine, heat recovery steam generator, and utility interconnection substation addition. Engineer of Record facilitating review and approval of the associated PJM Regional Transmission Authority interconnection impact study and agreement. *#* 

# 70MW Cogeneration Facility, ArcelorMittal, Cleveland OH (2019-2020)

Project manager responsible for the interconnection design of a 70MW steam turbine generator and 11.5KV power system additions to the facilities existing power house and primary utility 138KV substation. #