CITY OF COLUMBIA AGREEMENT #137/2023
FOR
ENGINEERING SERVICES: UTILITY SCALE BATTERY STUDY
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Exhibits

AGREEMENT
Between
THE CITY OF COLUMBIA, MISSOURI
And
LEIDOS ENGINEERING, LLC
For
ENGINEERING SERVICES: UTILITY SCALE BATTERY STUDY

THIS AGREEMENT (hereinafter "Agreement") between the City of Columbia, Missouri, a municipal corporation (hereinafter "City") and Leidos Engineering, LLC, with an address of 1750 Presidents Street, Reston, VA 20190, (hereinafter "Firm") is entered into on the date of the last signatory noted below (the "Effective Date"). City and Firm are each individually referred to herein as a "Party" and collectively as the "Parties."

WITNESSETH:

WHEREAS, City desires utility scale battery energy storage systems that can support the City's goal to increase renewable energy adaptation. The City needs to determine the technical feasibility, reliability impacts, costs, and operational aspects of a battery energy storage system (hereinafter "BESS") on either City's 69kV or 13.8kV substation levels in City's substation as outlined in City's Request for Qualifications #137/2023 and Addendum #1 attached as Exhibit A; in Firm's Proposal in response to City's Request for Qualifications attached as Exhibit B; and in Detailed Scope of Work and Fees attached as Exhibit C; and

WHEREAS, Firm desires to provide City professional services to analyze City's electrical infrastructure and make recommendations for how or if City owned utility scale batteries may impact the reliability of the electric grid and potentially move the City toward its goals of increasing renewable energy adaptation; and Firm represents and warrants that Firm is equipped, knowledgeable, competent, and able to provide all of the professional services necessary or appropriate in accordance with this Agreement.

NOW, THEREFORE, in consideration of the mutual covenants set out in this Agreement and for other good and valuable consideration (the receipt and sufficiency of which is hereby acknowledged), the Parties agree as follows.

1. Scope of Services.

a. Scope of Services. The scope of services requires professional services for a BESS Operational Study including cost analysis, maintenance procedures, safety concerns and personnel considerations; Technical Studies to confirm technical feasibility impacts, and required electric transmission and distribution upgrades of BESS systems; Final Report development; and contemplating multiple interconnection and ownership scenarios (hereinafter "Project"). The

Project is more fully described in City's Request for Qualifications #137/2023 (hereinafter "RFQ") and Addendum #1, attached as Exhibit A and incorporated herein; and in Firm's Proposal dated October 12, 2023 in response to RFQ (hereinafter "Firm's Proposal") attached as Exhibit B and incorporated herein; and in Detailed Scope of Work and Fees dated April 11, 2024, attached as Exhibit C and incorporated herein.

2. Addition or Deletions to Services. City may add to Firm's services or delete therefrom, provided that the total cost of such work does not exceed the total cost allowance as specified herein. Firm shall undertake such changed activities only upon the written direction of City. All such directives and changes shall be in written form and prepared and approved by the Parties. There shall be no change in the Project unless specifically identified and agreed to by Firm and City at the time such services are added or deleted.

3. Exchange of Data. All information, data, and reports in City's possession and necessary for the carrying out of the work, shall be furnished to Firm without charge, and the Parties shall cooperate with each other in every way possible in carrying out the Project.

4. Personnel. Firm represents that Firm will secure at Firm's own expense, all personnel required to perform the services called for under this Agreement by Firm. Such personnel shall not be employees of or have any contractual relationship with City, except as employees of Firm. All of the services required hereunder will be performed by Firm or under Firm's direct supervision. All Firm's personnel engaged in the work shall be fully qualified and shall be authorized under state and local law to perform such services. None of the work or services covered by this Agreement shall be subcontracted without the prior written approval of City.

5. Term. This Agreement shall commence on the Effective Date and shall proceed as set forth in the Project schedule.

6. Costs not to Exceed. City agrees to pay Firm on an hourly basis at the rates set forth in the Detailed Scope of Work and Fees contained in Exhibit C, in a total amount not to exceed the sum of **Ninety-Nine Thousand Nine Hundred Fifty-Seven Dollars and no cents ($99,957.00)**. Should Exhibit C allow Firm to charge expenses, the Parties have established a maximum sum of zero additional dollars ($0.00) for Firm's expenses as outlined in this Agreement. Any expenses shall be documented and are reimbursable at cost only.

7. Payment.

a. Firm may issue an invoice on a monthly basis for work performed and expenses since the preceding invoice or, if there was no preceding invoice, since the issuance of a notice to proceed.

b. Conditioned upon acceptable performance. Provided Firm performs the services in the manner set forth in this Agreement, City agrees to pay Firm in accordance with the terms outlined herein, which shall constitute complete compensation for all services to be rendered under this Agreement; provided, that where payments are to be made periodically to Firm for services rendered under this Agreement, City expressly reserves the right to disapprove in whole or in part a request for payment where the services rendered during the period for which payment is claimed are not performed in a timely and satisfactory manner.

c. City shall have ten (10) days from the date of receipt of the invoice to register City's disapproval of the work billed on that invoice. Following Firm's receipt of said disapproval, Firm shall have ten (10) days to cure the issues presented. If cure cannot be obtained within ten (10) days, Firm shall notify City of the proposed amount of time for cure, and reach an agreement as to an acceptable alternative deadline.

d. Upon receipt of the invoice and progress report, City will, as soon as practical, pay Firm for the services rendered. City shall pay Firm within thirty (30) days of receipt of an invoice.

8. Termination of Agreement.

a. Termination for Breach. Failure of Firm to fulfill Firm's obligations under this Agreement in a timely and satisfactory manner in accordance with the schedule and description of services for the Project agreed to by both Parties shall constitute a breach of this Agreement, and City shall thereupon have the right to immediately terminate this Agreement. City shall give seven (7) days written notice of termination to Firm by one of three different means: Facsimile Transmission ("FAX") if Firm has a FAX number; U.S. Postal Service Mails; or by hand delivering a copy of the same to Firm; or may give notice by any combination of the above methods. The date of termination shall be the date upon which notice of termination is hand delivered to Firm or given by FAX, or the third day following mailing of the notice of termination, whichever first occurs. In the event of termination for breach, City, at its sole option, may utilize any and all finished or unfinished documents, data, studies, and reports or other materials prepared by Firm under this Agreement prior to the date of termination. Firm shall not be relieved of liability to City for damages sustained by City by virtue of any such breach of this Agreement by Firm.

b. Termination for Convenience. City shall have the right at any time by written notice to Firm to terminate and cancel this Agreement, without cause, for the convenience of City, and Firm shall immediately stop work. In such event,

City shall not be liable to Firm except for payment for actual work performed prior to such notice in an amount proportionate to the completed contract price and for the actual costs of preparations made by Firm for the performance of the cancelled portions of the Agreement, including a reasonable allowance of profit applicable to the actual work performed and such preparations. In the event of termination for convenience, City, at its sole option, may purchase, for just and equitable compensation any and all finished or unfinished documents, data, studies, surveys and reports or other materials prepared by Firm under this Agreement. Any reuse of any satisfactory work completed prior to the termination for convenience shall be at City's own risk and without any liability to Firm. Anticipatory profits and consequential damages shall not be recoverable by Firm.

9. Ownership of Intellectual Property and Work Product.

a. Any software, research, reports, studies, surveys, data, photographs, videos, negatives or other documents, drawings or materials prepared by Firm in the performance of its obligations under the Agreement shall be the exclusive property of the City and all such materials shall be delivered to the City by Firm upon completion, termination or cancellation of the Agreement. Firm may, at its own expense, keep copies of all its writing for its personal files. Firm shall not use, willingly allow, or cause to have such materials used for any purpose other than the performance of Firm's obligations under this contract without prior written consent of the City; provided, however, that Firm shall be allowed to use non-confidential materials for writing samples in pursuit of the work. The ownership rights described herein shall include, but not be limited to, the right to copy, publish, display, transfer, prepare derivative works, or otherwise use written works.

b. Notwithstanding the City's ownership of the work product, City acknowledges and agrees that: (i) Firm has the right to re-use any of its pre-existing know-how, ideas, concepts, methods, processes, or similar information, however characterized, whether in tangible or intangible form, and whether used by Firm in the performance of the Project or not, at any time and without limitation, and (ii) Firm retains ownership of any and all of its intellectual property rights that existed prior to the Effective Date including, but not limited to, all methods, concepts, designs, reports, programs, and templates.

c. Pre-existing works include inventions (whether or not patentable), works of authorship, trade secrets, techniques, know-how, ideas, concepts, algorithms, and other intellectual property which existed prior to commencement of this Agreement. No property rights to any pre-existing works shall enure to the City. To the extent that Firm incorporates pre-existing work into a derivative work for City, Firm will retain ownership of such derivative work, except for those items identified in Paragraph 9.a above, and provided that it hereby grants City a royalty free, nonexclusive, perpetual, non-transferable, non-assignable, limited

license to use the work solely for internal purposes. The work product cannot be used for any outside jurisdiction without written permission from Firm.

10. Insurance. Firm shall maintain, on a primary basis and at its sole expense, at all times during the life of this Agreement the following insurance coverages, limits, including endorsements described herein. The requirements contained herein, as well as the CITY's review or acceptance of insurance maintained by Firm is not intended to, and shall not in any manner limit or qualify the liabilities or obligations assumed by Firm under this Agreement. Coverage to be provided as follows by a carrier with A.M. Best minimum rating of A-VI.

a. Workers' Compensation & Employers Liability. Firm shall maintain Workers' Compensation in accordance with Missouri State Statutes or provide evidence of monopolistic state coverage. Employers Liability with the following limits: $500,000 for each accident, $500,000 for each disease for each employee, and $500,000 disease policy limit.

b. Commercial General Liability. Firm shall maintain Commercial General Liability at a limit of $2,000,000 Each Occurrence, $3,000,000 Annual Aggregate. Coverage shall not contain any endorsement(s) excluding nor limiting Product/Completed Operations, Contractual Liability or Cross Liability.

c. Business Auto Liability. Firm shall maintain Business Automobile Liability at a limit of $2,000,000 Each Occurrence. Coverage shall include liability for Owned (if applicable), Non-Owned & Hired automobiles. In the event Firm does not own automobiles, Firm agrees to maintain coverage for Hired & Non-Owned Auto Liability, which may be satisfied by way of endorsement to the Commercial General Liability policy or separate Business Auto Liability policy.

d. Professional Liability. If the Scope of Services require the work of a licensed professional, Firm agrees to maintain Professional (Errors & Omissions) Liability at a limit of liability not less than $2,000,000 per occurrence and $3,000,000 aggregate. For policies written on a "Claims-Made" basis, Firm agrees to maintain a Retroactive Date prior to or equal to the Effective Date of this Agreement. In the event the policy is canceled, non-renewed, switched to an Occurrence Form, retroactive date advanced; or any other event triggering the right to purchase a Supplemental Extended Reporting Period (SERP) during the life of this Agreement, Firm agrees to purchase a SERP with a minimum reporting period not less than two (2) years. The requirement to purchase a SERP shall not relieve Firm of the obligation to provide replacement coverage.

e. Firm may satisfy the liability limits required for Commercial General Liability or Business Auto Liability under an Umbrella or Excess Liability policy. There is no minimum per occurrence limit of liability under the Umbrella or Excess Liability; however, the Annual Aggregate limit shall not be less than the highest "Each Occurrence" limit for either Commercial General Liability or Business Auto Liability. Firm agrees to endorse City as an Additional Insured on

the Umbrella or Excess Liability, unless the Certificate of Insurance state the Umbrella or Excess Liability provides coverage on a "Follow-Form" basis.

f. The City of Columbia, its elected officials and employees are to be Additional Insured with respect to the Project to which these insurance requirements pertain. A certificate of insurance evidencing all coverage required is to be provided at least ten (10) days prior to the Effective Date of the Agreement between the Firm and City. Firm is required to maintain coverages as stated and required to notify City of a Carrier Change or cancellation within two (2) business days. City reserves the right to request a copy of the policy.

g. The Parties hereto understand and agree that City is relying on, and does not waive or intend to waive by any provision of this Agreement, any monetary limitations or any other rights, sovereignty, immunities, or protections provided under federal, state or local laws or rules as from time to time amended, or otherwise available to City, or its elected officials or employees.

h. Failure to maintain the required insurance in force may be cause for termination of this Agreement. In the event Firm fails to maintain and keep in force the required insurance or to obtain coverage from its subcontractors, City shall have the right to cancel and terminate this Agreement without notice.

i. The insurance required by the provisions of this article is required in the public interest and City does not assume any liability for acts of Firm and/or Firm's employees and/or Firm's subcontractors in the performance of this Agreement.

11. Conflicts. No salaried officer or employee of City and no member of City Council shall have a financial interest, direct or indirect, in this Agreement. A violation of this provision renders this Agreement void. Any federal regulations and applicable provisions in Section 105.450 et seq. RSMo shall not be violated. Firm covenants that it presently has no interest and shall not acquire any interest, direct or indirect, which would conflict in any manner or degree with the performance of services to be performed under this Agreement. Firm further covenants that in the performance of this Agreement no person having such interest shall be employed.

12. Assignment. Firm shall not assign any interest in this Agreement, and shall not transfer any interest in the same (whether by assignment or novation), without prior written consent of City thereto. Notice of such assignment or transfer shall be furnished in writing promptly to City. Any such assignment is expressly subject to all rights and remedies of City under this Agreement, including the right to change or delete activities from this Agreement or to terminate the same as provided herein, and no such assignment shall require City to give any notice to any such assignee of any actions which City may take under this Agreement, though City will attempt to so notify any such assignee.

13. Compliance with Laws. Firm agrees to comply with all applicable federal, state and local laws or rules and regulations applicable to the provision of services hereunder.

14. Employment Of Unauthorized Aliens Prohibited. Firm agrees to comply with Missouri State Statute section 285.530, as amended, in that Firm shall not knowingly employ, hire for employment, or continue to employ an unauthorized alien to perform work within the state of Missouri. As a condition for the award of this Agreement, Firm shall, by sworn affidavit and provision of documentation, affirm its enrollment and participation in a federal work authorization program with respect to the employees working in connection with the contracted services. Firm shall also sign an affidavit affirming that it does not knowingly employ any person who is an unauthorized alien in connection with the contracted services. Firm shall require each subcontractor to affirmatively state in its contract with Firm that the subcontractor shall not knowingly employ, hire for employment or continue to employ an unauthorized alien to perform work within the state of Missouri. Firm shall also require each subcontractor to provide Firm with a sworn affidavit under the penalty of perjury attesting to the fact that the subcontractor's employees are lawfully present in the United States.

15. General Independent Contractor Clause. This Agreement does not create an employee/employer relationship between the Parties. It is the Parties' intention that the Firm will be an independent contractor and not City's employee for all purposes, including, but not limited to, the application of the Fair Labor Standards Act minimum wage and overtime payments, Federal Insurance Contribution Act, the Social Security Act, the Federal Unemployment Tax Act, the provisions of the Internal Revenue Code, Missouri revenue and taxation laws, Missouri workers' compensation and unemployment insurance laws. Firm will retain sole and absolute discretion in the judgment of the manner and means of carrying out Firm's activities and responsibilities hereunder. Firm agrees that it is a separate and independent enterprise from the public employer, that it has a full opportunity to find other business, that it has made its own investment in its business, and that it will utilize a high level of skill necessary to perform the work. This Agreement shall not be construed as creating any joint employment relationship between Firm and City, and City will not be liable for any obligation incurred by Firm, including but not limited to unpaid minimum wages and/or overtime premiums.

16. Hold Harmless Agreement: To the fullest extent not prohibited by law, Firm shall indemnify and hold harmless the City of Columbia, its directors, officers, agents, and employees from and against all claims, damages, losses, and expenses (including but not limited to attorney's fees) arising by reason of any act or failure to act, negligent or otherwise, of Firm, of any subcontractor (meaning anyone, including but not limited to consultants having a contract with Firm or a subcontractor for part of the services), of anyone directly or indirectly employed by Firm or by any subcontractor, or of anyone for whose acts Firm or its subcontractor may be liable, in connection with providing these services. This

provision does not, however, require Firm to indemnify, hold harmless, or defend the City of Columbia from its own actions, inactions, (willful or otherwise), or its own negligence.

17. No Waiver of Sovereign Immunity. In no event shall the language of this Agreement constitute or be construed as a waiver or limitation for either Party's rights or defenses with regard to each Party's applicable sovereign, governmental, or official immunities and protections as provided by federal and state constitution or law.

18. Professional Oversight Indemnification. Firm understands and agrees that City has contracted with Firm based upon Firm representations that Firm is a skilled professional and fully able to provide the services set out in this Agreement. In addition to any other indemnification set out in this Agreement, Firm agrees to defend, indemnify and hold and save harmless City from any and all claims, settlements, and judgments whatsoever arising out of City's alleged negligence in hiring or failing to properly supervise Firm.

19. Professional Responsibility. Firm shall exercise reasonable skill, care, and diligence in the performance of its services and will carry out its responsibilities in accordance with customarily accepted good professional practices. If Firm fails to meet the foregoing standard, Firm shall perform at its own cost, and without reimbursement from City, the professional services necessary to correct the errors and omissions which are caused by Firm's failure to comply with above standard, and which are reported to Firm within one (1) year from the completion of Firm's services for the Project.

20. Governing Law and Venue. This Agreement shall be governed, interpreted, and enforced in accordance with the laws of the State of Missouri and/or the laws of the United States, as applicable. The venue for all litigation arising out of, or relating to this Agreement, shall be in Boone County, Missouri, or the United States Western District of Missouri. The Parties hereto irrevocably agree to submit to the exclusive jurisdiction of such courts in the State of Missouri. The Parties agree to waive any defense of forum non conveniens.

21. No Third-Party Beneficiary. No provision of this Agreement is intended to nor shall it in any way inure to the benefit of any customer, property owner or any other third party, so as to constitute any such Person a third-party beneficiary under this Agreement.

22. Certification/Licensing. Firm agrees to comply with all applicable local, state, and federal certification and licensing requirements and applicable laws and to remain in "good standing" with all applicable oversight entities. To the extent required by Section 327.401 of the Missouri Revised Statutes, as amended, Firm understands and agrees that the person personally in charge of supervising the professional engineering services of Firm under the Agreement shall be licensed and authorized to practice engineering in Missouri, and the Firm will keep and

maintain a valid certificate of authority from the Missouri Board for Architects, Professional Engineers, Professional Land Surveyors and Professional Landscape Architects.

23. Notices. Any notice, demand, request, or communication required or authorized by this Agreement shall be delivered either by hand, facsimile, overnight courier or mailed by certified mail, return receipt requested, with postage prepaid, to:

If to City:	**If to Firm:**
City of Columbia Utilities Department ATTN: Eric Worts P.O. Box 6015 Columbia, MO 65205-6015	Leidos Engineering, LLC ATTN: Sridhar Chouhan 308 Melbourne Ct, Clarksville, TN 37043

The designation and titles of the person to be notified or the address of such person may be changed at any time by written notice. Any such notice, demand, request, or communication shall be deemed delivered on receipt if delivered by hand or facsimile and on deposit by the sending party if delivered by courier or U.S. mail.

24. Public Records Act. City is subject to the Missouri Sunshine Law. The Parties agree that this Agreement shall be interpreted in accordance with the provisions of the Missouri Sunshine Law as amended and Firm agrees to maintain the confidentiality of information which is not subject to public disclosure under the Sunshine Law.

25. Amendment. No amendment, addition to, or modification of any provision hereof shall be binding upon the Parties, and neither Party shall be deemed to have waived any provision or any remedy available to it unless such amendment, addition, modification or waiver is in writing and signed by a duly authorized officer or representative of the applicable Party or Parties.

26. Audit. Firm shall maintain financial records according to generally accepted accounting standards. City has the right, at its sole expense and during normal working hours, to examine the records of Firm to the extent reasonably necessary to verify the accuracy of any statement, charge or computation made pursuant to this Agreement.

27. Nondiscrimination. During the performance of this Agreement, Firm shall not discriminate against any employee, applicant for employment or recipient of services because of race, color, religion, sex, sexual orientation, gender identity or expression, age, disability, national origin, receipt of governmental assistance, source of income, or any other legally protected category. Consultant shall comply with all provisions of laws, rules and regulations governing the regulation

of Equal Employment Opportunity including Title VI of the Civil Rights Act of 1964 and Chapter 12 of the City of Columbia's Code of Ordinances.

28. Missouri Anti-Discrimination Against Israel Act. To the extent required by Missouri Revised Statute Section 34.600 and not in violation of the state or federal constitution, Firm certifies it is not currently engaged in and shall not, for the duration of this Agreement, engage in a boycott of goods or services from the State of Israel; companies doing business in or with Israel or authorized by, licensed by, or organized under the laws of the State of Israel; or persons or entities doing business in the State of Israel. If any provision of this paragraph, or the application of such provision to any person or circumstance, shall be held invalid, the remainder of this Agreement, or the application of such provision to persons or circumstances other than those as to which it is held invalid, shall not be affected thereby. This paragraph shall not apply to contracts with a total potential value of less than one hundred thousand dollars ($100,000.00) or to contractors with fewer than ten (10) employees.

29. Counterparts and Electronic Signatures. This Agreement may be signed in one or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same document. Faxed signatures, or scanned and electronically transmitted signatures, on this Agreement or any notice delivered pursuant to this Agreement, shall be deemed to have the same legal effect as original signatures on this Agreement.

30. Contract Documents. The Contract Documents include this Agreement and the following attachments and exhibits which are incorporated herein by reference.

Exhibits

A RFQ #137/2023 containing City's Scope of Work, and Addendum 1
B Firm's October 12, 2023 Proposal in response to RFQ
C Detailed Scope of Work and Fees dated April 11, 2024

In the event of a conflict between the terms of any of the Contract Documents and the terms of this Agreement, the terms of this Agreement control. In the event of a conflict between the terms of any Contract Documents, the terms of the documents control in the order listed above.

31. Entire Agreement. This Agreement represents the entire and integrated agreement between the Parties relative to the Project herein. All previous or contemporaneous contracts, representations, promises and conditions relating to Firm's services on this Project described herein are superseded.

32. Limitation of Liability. TO THE FULLEST EXTENT PERMITTED BY LAW, EXCEPT FOR DAMAGES DUE TO GROSS NEGLIGENCE OR WILLFUL MISCONDUCT, FIRM'S TOTAL LIABILITY TO CITY FOR DAMAGES OF ANY TYPE RELATED TO OR ARISING OUT OF THE WORK AUTHORIZED UNDER

THIS AGREEMENT SHALL NOT EXCEED NINETY-NINE THOUSAND NINE HUNDRED FIFTY-SEVEN DOLLARS AND NO CENTS ($99,957.00), WHETHER SUCH LIABILITY IS BASED IN CONTRACT, TORT, STRICT LIABILITY OR ANOTHER THEORY OF LIABILITY. NOTWITHSTANDING THE FOREGOING, BOTH PARTIES AGREE AND UNDERSTAND THIS LIMIT ON LIABILITY DOES NOT APPLY TO, AND IS WHOLLY INDEPENDENT OF, FIRM'S INSURANCE REQUIREMENTS AND HOLD HARMLESS OBLIGATIONS UNDER THIS AGREEMENT.

33. Waiver of Special Damages. Neither Party shall be liable for any indirect, special, consequential or punitive damages.

[SIGNATURES ON FOLLOWING PAGE]

IN WITNESS WHEREOF, the Parties hereto have set their hands on the day and year written below.

CITY OF COLUMBIA, MISSOURI

By: _____

Name: _____

Title: _____

Date: _____

APPROVED AS TO FORM:

By: _____
Nancy Thompson, City Counselor/ek

CERTIFICATION: I hereby certify that this Agreement is within the purpose of the appropriation to which it is to be charged, Account Number 17440923 504990, and that there is an unencumbered balance to the credit of such appropriation sufficient to pay therefor.

By: _____
Matthew Lue, Director of Finance

Leidos Engineering, LLC

By: Alex Kim

Name: Alex Kim

Title: Contracts Manager

Date: May 6, 2024

ATTEST:

By: _____

Name: _____

SOLICITATION NO.: Request for Qualifications (RFQUAL) 137/2023
BUYER: Cale Turner
PHONE NO.: (573) 874-7375
E-MAIL: cale.turner@como.gov

TITLE: Engineering Services: Utility Scale Battery Study

ISSUE DATE: September 13, 2023

RETURN QUALIFICATIONS NO LATER THAN: October 13, 2023 AT 5:00 PM CENTRAL TIME (END DATE)

VENDORS ARE ENCOURAGED TO RESPOND ELECTRONICALLY THROUGH THE CITY'S E-BIDDING WEBSITE BUT MAY RESPOND BY HARD COPY (See Mailing Instructions Below)

MAILING INSTRUCTIONS: Print or type **Solicitation Number** and **End Date** on the lower left hand corner of the envelope or package. Delivered sealed qualifications must be in the Purchasing Division office (701 E. Broadway, 5th Floor) by the return qualifications date and time.

	(U.S. Mail)		(Courier Service)
RETURN QUALIFICATIONS TO:	**CITY OF COLUMBIA PURCHASING PO BOX 6015 COLUMBIA MO 65205**	**or**	**CITY OF COLUMBIA PURCHASING 701 E. BROADWAY, 5th FLOOR COLUMBIA MO 65201**

ORIGINAL CONTRACT PERIOD: Date of Award through Project Completion

DELIVER SUPPLIES/SERVICES FOB (Free On Board) DESTINATION TO THE FOLLOWING ADDRESS:

City of Columbia
Utilities Department
Columbia, Missouri

The offeror hereby declares understanding, agreement and certification of compliance to provide the items and/or services, at the prices quoted, in accordance with all requirements and specifications contained herein. The offeror further agrees that the language of this RFQUAL shall govern in the event of a conflict with their qualifications. The offeror further agrees that upon receipt of an authorized purchase order from the Purchasing Division or when a Contract/Agreement is signed and issued by an authorized official of the City of Columbia, a binding contract shall exist between the offeror and the City of Columbia.

SIGNATURE REQUIRED

VENDOR NAME	
MAILING ADDRESS	
CITY, STATE, ZIP CODE	
CONTACT PERSON	**EMAIL ADDRESS**
PHONE NUMBER	**FAX NUMBER**
VENDOR TAX FILING TYPE WITH IRS (CHECK ONE) ___ Corporation ___ Individual ___ State/Local Government ___ Partnership ___ Sole Proprietor ___IRS Tax-Exempt	
AUTHORIZED SIGNATURE	**DATE**
PRINTED NAME	**TITLE**

1. INTRODUCTION AND GENERAL REQUIREMENTS

INTRODUCTION:

This document constitutes a request for competitive, sealed qualifications for the provision of engineering services for a Utility Scale Battery Study for the City of Columbia, Utilities Department (hereinafter referred to as City) as set forth herein.

The City is seeking qualified engineer to analyze its electrical infrastructure and make recommendations for how or if City owned utility scale batteries may impact the reliability of the electric grid and potentially move the City toward its goals of increasing renewable energy adaptation. The City has roughly 60,000 electrical customers served by 8 substations. The City owns 2 power plants, but imports most of its power requirements. The City is requesting a report, sealed by an Engineer registered in the State of Missouri that will be shared with staff, City Council and the Water and Light advisory board. It is allowable to have a public and confidential version of this report in order to satisfy adherence to NERC compliance and any NDA that the City has with neighboring utilities, reliability coordinators, and other compliance entities. Selection of a professional surveying contractor shall be in accordance with Missouri State Statutes.

Organization - This document, referred to as Request for Qualifications (RFQUAL), is divided into the following parts:

1) Introduction and General Information
2) Scope of Services
3) Qualifications Submission Information
4) Selection Criteria
5) Exhibits A – F

Terminology/Definitions: Whenever the following words and expressions appear in a RFQUAL document or any addendum thereto, the definition or meaning described below shall apply.

- Addendum/Amendment means a written, official modification to an RFQUAL.
- Attachment applies to all forms which are included with an RFQUAL to incorporate any informational data or requirements related to the performance requirements and/or specifications.
- Qualifications end date and time and similar expressions mean the exact deadline required by the RFQUAL for the receipt of sealed qualifications.
- Offeror means the supplier, vendor, person, or organization that responds to an RFQUAL by submitting a qualifications with prices to provide the equipment, supplies, and/or services as required in the RFQUAL document.
- Buyer means the procurement staff member of the Purchasing Division. The contact person as referenced herein is usually the buyer.
- Contract means a legal and binding agreement between two or more competent parties, for a consideration for the procurement of equipment, supplies, and/or services.
- Contractor means a supplier, offeror, person, or organization who is a successful offeror as a result of an RFQUAL and who enters into a contract.
- Exhibit applies to forms, which are included with an RFQUAL for the offeror to complete and submit with the sealed qualifications prior to the specified end date and time.
- Request for Qualifications (RFQUAL) means the solicitation document issued by the Purchasing Division to potential offerors for the purchase of equipment, supplies, and/or

services as described in the document. The definition includes all exhibits, attachments, and addendums thereto.

- May means that a certain feature, component, or action is permissible, but not required.
- Must means that a certain feature, component, or action is a mandatory condition.
- Shall have the same meaning, as the word must.
- Should means that a certain feature, component and/or action are desirable but not mandatory.

SCHEDULE OF ACTIVITIES:

DATE	ACTIVITY
September 27, 2023	Close of written *Requests for Additional Information*
September 29, 2023	Written responses to *Requests for Additional Information* sent to all
October 13, 2023	Request for Qualifications is due at 5:00 p.m. CST
November 2023	Contract Start Date
*The above dates are target dates and are subject to change by the City of Columbia.	

QUALIFICATIONS SUBMISSION:

Qualifications may be submitted in a sealed envelope at the purchasing office **or** uploaded electronically on the City's E-bidding website. No fax or e-mail qualifications will be accepted. Sealed qualifications must be delivered to the Finance Department, Purchasing Division, 701 E. Broadway, 5th Floor, Columbia, MO 65201 by the closing date and time. Qualifications received after the appointed time will be determined non-responsive and will not be opened. Sealed qualifications must be submitted in three (3) copies, one of which must be an original and so marked. The qualifications must be in sealed envelopes and marked in bold letters "RFQUAL 137/2023: ENGINEERING SERVICES: BATTERY STUDY."

QUESTIONS/CLARIFICATIONS OF THE REQUEST FOR QUALIFICATIONS:

All questions concerning the solicitation and specifications shall be submitted in writing via e-mail or fax to the name below. You are encouraged to submit your questions via e-mail.

Cale Turner, Purchasing Agent
Phone: (573) 874-7375
E-mail: cale.turner@como.gov

Any oral responses to any question shall be unofficial and not binding on the City of Columbia. An Addendum to this RFQUAL providing the City of Columbia's official response will be issued if necessary to all known prospective offerors. Questions must be submitted no later than 5:00 p.m. on September 27, 2023.

This written *Request for Additional Information* will take place of the normal Pre-Qualifications Conference.

VALIDITY OF QUALIFICATIONS:

Offerors agree that qualifications submitted will remain firm for a period of ninety (90) calendar days after the date specified for the return of qualifications.

REJECTION OF QUALIFICATIONS:

The City of Columbia reserves the right to reject any or all qualifications received in response to this RFQUAL, or to cancel the RFQUAL if it is in the best interest of the City of Columbia to do so. Failure to furnish all information requested in this RFQUAL may disqualify the qualifications. Any exceptions to the requirements specified must be identified in the qualifications.

WITHDRAWAL OF QUALIFICATIONS:

Any offeror may withdraw their qualifications at any time prior to the scheduled closing time for the receipt of qualifications. However, no qualifications will be withdrawn for a period of ninety (90) calendar days after the scheduled closing time for the receipt of qualifications.

ALTERATION OF SOLICITATION:

The wording of the City of Columbia's solicitation may not be changed or altered in any manner. Offerors taking exception to any clause in whole or in part should do so by listing said exceptions on their letterhead and submitting them with their qualifications; such exceptions will be evaluated and accepted or rejected by the City of Columbia, whose decision will be final.

RESPONSE MATERIAL OWNERSHIP:

All material submitted regarding this RFQUAL becomes the property of The City of Columbia. Any person may review qualifications after the Agreement has been issued, subject to the terms of this solicitation.

INCURRING COSTS:

The City of Columbia shall not be obligated or be liable for any cost incurred by offerors prior to issuance of an Agreement. All costs to prepare and submit a response to this solicitation shall be borne by the offeror.

COLLUSION CLAUSE:

Any agreement or collusion among offerors and prospective offerors to illegally restrain freedom of competition by agreement to fix prices, or otherwise, will render the qualifications of such offerors void.

CONTRACT DOCUMENTS:

The final agreement between the City of Columbia and the offeror will include by reference:

- Offeror's Response to the RFQUAL
- The City Issued RFQUAL with any addendums

Any changes, additions or modifications hereto will be in writing and signed by the City Manager. No other individual is authorized to modify the agreement in any manner.

FUNDS:

Financial obligations of the City of Columbia payable after the current fiscal year are contingent upon funds

for that purpose being appropriated, budgeted, and otherwise made available. In the event funds are not appropriated, any resulting Contract will become null and void, without penalty to the City of Columbia.

MISSOURI LICENSURE AND CERTIFICATE OF AUTHORITY:

Offeror certifies that it is currently in compliance, and agrees to maintain compliance for the duration of the agreement/contract, with all licensure requirements of the Missouri Board for Architects, Professional Engineers, Professional Land Surveyors and Professional Landscape Architects (hereinafter referred as APEPLSPLA) to practice in Missouri as a professional engineer as provided under Chapter 327 of the Missouri Revised Statutes. To the extent required by Section 327.401 of the Missouri Revised Statutes, offeror understands and agrees that the person personally in charge and supervising the professional engineering services of offeror under the agreement/contract shall be licensed and authorized to practice engineering in Missouri, and the offeror will keep and maintain a valid certificate of authority from APEPLSPLA.

2. SCOPE OF SERVICES

The engineer shall examine the cost to the utility in terms of capital and operation expenses. They should provide high level explanation of required maintenance procedures and possible safety concerns. This should include recommendation of specialized training for personnel and potential increase in number of full time equivalent (FTE) positions for specialized service to utility scale batteries. The engineer should address concerns for safety to residents in the area of battery installs as well as safety to maintenance personnel.

The engineer shall examine effect on distribution and transmission system reliability. Utility scale batteries can be installed at either 69 kV or 13.8 kV substation levels in the City's substations. The engineer should address the positives and negatives of installing at each voltage level. The engineer should address any other potential requirements such as change in relay protection systems from existing methodologies. The engineer should be able to take existing models that have been developed by the City to perform simulations using PSSE or other suitable software. The engineer should be able to examine historical loading and load forecasting data to make reasonable assumptions for how the grid will be affected by the installation of batteries. The engineer shall recommend transmission or distribution level grid upgrades in order to support utility scale batteries.

The engineer shall examine how the utility battery storage would affect the participation of the City in the energy market keeping in mind the resource adequacy requirements of the utility. The City participates in the MISO market and maintains energy and capacity reserves as dictated by MISO.

The engineer shall compare the costs and benefits of a utility owned versus a third party owned and operated battery system.

The engineer shall examine three (3) specific scenarios where utility scale battery can be used on the City's electric system. They should identify any transmission or distribution upgrades that may be required to accommodate these scenarios.

Scenario 1:

- Replace a 14MW combustion gas turbine with a utility scale battery. This is an aging fossil fuel resource located at our municipal power plant. The generator is connected to the 13.8kV bus and supports distribution load at the substation in times of high usage.

Scenario 2:

- Install a distribution level utility battery at a substation nearing capacity of its substation level transformers as an effort to defer more extensive capital improvements.

Scenario 3:

- Install a transmission level utility battery at a substation requiring additional transmission capacity as an effort to defer more extensive capital improvements.

Additional information on load, transmission contingencies, and schematics will be provided to the engineer upon contract initiation.

3. QUALIFICATIONS SUBMISSION INFORMATION

SUBMISSION OF QUALIFICATIONS:

On-line Qualifications - If a registered offeror is responding electronically through the City of Columbia Bidding System website, the registered offeror should submit completed exhibits, forms, and other information concerning the qualifications as an attachment to the electronic qualifications. The registered offeror is instructed to review the RFQUAL submission provisions carefully to ensure they are providing all required information.

The exhibits and forms provided herein can be saved into a word processing document, completed by a registered offeror, and then sent as an attachment to the electronic submission. Other information requested or required may be sent as an attachment. Be sure to include the solicitation/bid number, company name, and a contact name on any electronic attachments.

In addition, a registered offeror may submit the exhibits, forms, etc., through mail or courier service. However, any such submission must be received prior to the specified end date and time.

If a registered offeror submits an electronic and hard copy qualifications response and if such responses are not identical, the offeror should explain which response is valid. In the absence of an explanation, the City of Columbia shall consider the response which serves its best interest.

Hard Copy Qualifications - If the offeror is submitting qualifications via the mail or a courier service or is hand delivering the qualifications, the offeror should include completed exhibits, forms, and other information concerning the qualifications. The offeror is instructed to review the RFQUAL submission provisions carefully to ensure they are providing all required information.

Recycled Products - The City of Columbia recognizes the limited nature of our resources and the leadership role of government agencies in regard to the environment. Accordingly, the offeror is requested to print the qualifications double-sided using recycled paper, if possible, and minimize or eliminate the use of non-recyclable materials such as plastic report covers, plastic dividers, vinyl sleeves, and binding. Lengthy qualifications may be submitted in a notebook or binder.

The offeror should include three (3) additional copies along with their original qualifications. The front cover of the original qualifications should be labeled “original” and the front cover of all copies should be labeled “copy”. In case of a discrepancy between the original qualifications and the copies, the original qualifications shall govern.

Open Records - Pursuant to section 610.021, RSMo, the offeror’s qualifications shall be considered an open record after a contract is executed or all qualifications are rejected. At that time, all qualifications are scanned into the Purchasing Division imaging system.

The scanned information will be available upon request from the Purchasing Division. Therefore, the offeror is advised not to include any information in the qualifications that the offeror does not want to be viewed by the public, including personal identifying information such as social security numbers.
In preparing qualifications, the offeror should be mindful of document preparation efforts for scanning purposes and storage capacity that will be required to image the qualifications and

should limit qualifications content to items that provide substance, quality of content, and clarity of information.

To facilitate the evaluation process, the offeror is encouraged to organize their qualifications into sections that correspond with the individual evaluation categories described herein. The offeror is cautioned that it is the offeror's sole responsibility to submit information related to the evaluation categories and that the City of Columbia is under no obligation to solicit such information if it is not included with the qualifications. The offeror's failure to submit such information may cause an adverse impact on the evaluation of the qualifications.

The qualifications should be page numbered.

The signed page one from the original RFQUAL and all signed addendums should be placed at the beginning of the qualifications.

Each section should be titled with each individual evaluation category and all material related to that category should be included therein.

Questions Regarding the RFQUAL – Except as may be otherwise stated herein, the offeror and the offeror's agents (including subcontractors, employees, consultants, or anyone else acting on their behalf) must direct all of their questions or comments regarding the RFQUAL, the solicitation process, the evaluation, etc., to the buyer of record indicated on the first page of this RFQUAL. Inappropriate contacts to other personnel are grounds for suspension and/or exclusion from specific procurements. Offerors and their agents who have questions regarding this matter should contact the buyer.

The buyer may be contacted via e-mail or phone as shown on the first page.

Only those questions which necessitate a change to the RFQUAL will be addressed via an addendum to the RFQUAL. Offerors are advised that any questions received less than ten (10) calendar days prior to the RFQUAL opening date may not be addressed.

Joint Venture or Co-Counsel Response – If the qualifications is being submitted in conjunction with another entity or law firm (similar to a joint response, joint venture, or co-counsel), there can be only one (1) response submitted in response to the RFQUAL by the entities/firms involved. Therefore, only one (1) entity/firm must be designated as lead and must be designated as the official offeror for purposes of submitting the qualifications. Such lead offeror and contractor, if awarded the contract), must be the only party officially signing and submitting the qualifications as well as serving as the official signatory for the joint venture or co-counsel.

MINIMUM REQUIRED SUBMITTALS:

- A brief description of the firm (Exhibit A)
- The qualifications and background of the firm (Exhibit A)
- A summary of any arrangements that will be made with any other firm for assistance on the work (Exhibit D)

- A list of key personnel to be involved in the work (Exhibit C)

- A list of similar work performed for other municipalities or agencies, including a description of work and the name of the municipality or agency, and the action taken as a result of the work. A list of references should be included. (Exhibit B)

- Discussion explaining why the firm believes the City of Columbia would benefit from selecting the firm to do the work. (Exhibit D)

- A description of the approach the firm will take to complete the work, including an estimate of the total time needed for the firm to complete the work. (Exhibit D)

MISCELLANEOUS SUBMITTAL INFORMATION:

Affidavit of Work Authorization and Documentation - Pursuant to section 285.530, RSMo, if the offeror meets the section 285.525, RSMo, definition of a "business entity" (http://www.moga.mo.gov/statutes/C200-299/2850000525.HTM), the offeror must affirm the offeror's enrollment and participation in the E-Verify federal work authorization program with respect to the employees hired after enrollment in the program who are proposed to work in connection with the services requested herein. The offeror should complete Exhibit E, Business Entity Certification, Enrollment Documentation, and Affidavit of Work Authorization. Exhibit E must be submitted prior to an award of a contract.

The offeror should complete and submit Exhibit F, Miscellaneous Information.

Business Compliance - The offeror must be in compliance with the laws regarding conducting business in the City of Columbia. The offeror certifies by signing the signature page of this original document and any addendum signature page(s) that the offeror and any proposed subcontractors either are presently in compliance with such laws or shall be in compliance with such laws prior to any resulting contract award. The offeror shall provide documentation of compliance upon request by the Purchasing Division. The compliance to conduct business in the state shall include, but not necessarily be limited to:

Registration of business name (if applicable) with the Secretary of State at http://sos.mo.gov/business/startBusiness.asp
Certificate of authority to transact business/certificate of good standing (if applicable)
Taxes (e.g., city/county/state/federal)
State and local certifications (e.g., professions/occupations/activities)
Licenses and permits (e.g., city/county license, sales permits)
Insurance (e.g., worker's compensation/unemployment compensation)

4. SELECTION CRITERIA

CRITERIA:

After determining that a qualification satisfies the mandatory requirements stated in the RFQUAL, the evaluator(s) shall use both objective analysis and subjective judgment in conducting a comparative assessment of the qualifications in accordance with the criteria stated below.

- Evaluation of proposals/interview
- Proven background and experience in the work required
- Reputation of the firm with respect to design and construction or major public improvement projects.
- References provided
- Ability to complete the work in the time required
- Specific background and experience of the key people who will be involved in providing these services.

EVALUATION PROCESS:

After receipt of the qualifications, a review committee appointed by the City Manager at least two members of which are licensed professional engineers or architects shall evaluate the qualifications and select as a general rule, not less than three firms for interview.

After interviews are conducted, the review committee shall select a firm for negotiation of terms of an agreement/contract. The services in the agreement/contract shall substantially conform to those described in the RFQUAL. Modifications may be made to accommodate budget limitations or to address related issues not considered in the original scope of work.

COMPETITIVE NEGOTIATION OF QUALIFICATIONS:

The offeror is advised that under the provisions of this Request for Qualifications, the Purchasing Division reserves the right to conduct negotiations of the qualifications received or to award a contract without negotiations. If such negotiations are conducted, the following conditions shall apply**:**

Negotiations may be conducted in person, in writing, or by telephone.

Negotiations will only be conducted with potentially acceptable offeror. The Purchasing Division reserves the right to limit negotiations to those qualifications which received the highest rankings during the initial evaluation phase. All offerors involved in the negotiation process will be invited to submit a best and final offer if necessary.

Terms, conditions, methodology, or other features of the offeror's qualifications may be subject to negotiation and subsequent revision. As part of the negotiations, the offeror may be required to submit supporting financial and other data in order to allow a detailed evaluation of the feasibility, reasonableness, and acceptability of the qualifications.

The mandatory requirements of the Request for Qualifications shall not be negotiable and shall remain unchanged unless the Purchasing Division determines that a change in such requirements is in the best interest of the City of Columbia.

AGREEMENT/CONTRACT:

When agreement on a detailed scope of services and fee schedule is reached, a formal agreement/contract will be prepared and submitted to City Council for approval. If an agreement/contract cannot be reached, the City will terminate negotiations and select an alternate firm for negotiations.

EXHIBIT A

OFFEROR INFORMATION

The offeror should provide the following information about the offeror's organization:

Provide a brief company history, including the founding date and number of years in business as currently constituted.

Describe the nature of the vendor's business, type of services performed, etc. Identify the vendor's website address, if any.

Provide a list of and a short summary of information regarding the vendor's current contracts/clients.

List, identify, and provide reasons for each contract/client gained and lost in the past two (2) years.

EXHIBIT B

CURRENT/PRIOR EXPERIENCE

The offeror should copy and complete this form documenting the offeror and any subcontractor's current/prior experience considered relevant to the services required herein. In addition, the offeror is advised that if the contact person listed for verification of services is unable to be reached during the evaluation, the listed experience may not be considered.

Offeror Name or Subcontractor Name: _____ (if reference is for a Subcontractor):	
Reference Information (Current/Prior Services Performed For :)	
Name of Reference Company/Client:	
Address of Reference Company/Client:	
Reference Contact Person Name, Phone #, and E-mail Address:	
Title/Name of Service/Contract	
Dates of Project Initiation and Project Completion:	
If service/contract has terminated, specify reason:	
Description of Services Performed, such as: ✓ What the offeror did ✓ How the offeror did it ✓ Results ✓ Additional Detail	
Personnel Assigned to Service/Contract (include all key personnel and identify role):	

EXHIBIT C

EXPERTISE OF KEY PERSONNEL

(Copy and complete this table for each key person proposed)

Title of Position:_____	
Name of Person:	
Educational Degree (s): include college or university, major, and dates	
License(s)/Certification(s), #(s), expiration date(s), if applicable:	
Specialized Training Completed.	
# of years' experience in area of service proposed to provide:	
Describe person's relationship to offeror. If employee, # of years. If subcontractor, describe other/past working relationships	
Describe this person's responsibilities over the past 12 months.	
Previous employer(s), positions, and Dates	

Staffing Methodology

Describe the person's planned duties/role proposed herein:	

EXHIBIT D

WORK TO BE PERFORMED

The offeror should use this Exhibit, or any format desired, to present a written plan for performing the requirements specified in this Request for Qualifications.

EXHIBIT E

NOTICE TO OFFERORS

Sections 285.525 To 285.550 RSMo.

Pursuant to section 285.530 (1) RSMo., No business entity or employer shall knowingly employ, hire for employment, or continue to employ an unauthorized alien to perform work within the State of Missouri.

As a condition for the award of any contract or grant in excess of five thousand dollars by the state or by any political subdivision of the state to a business entity, or for any business entity receiving a state-administered or subsidized tax credit, tax abatement, or loan from the state, the business entity shall, by sworn affidavit and provision of documentation, affirm its enrollment and participation in a federal work authorization program with respect to the employees working in connection with the contracted services. Every such business entity shall sign an affidavit affirming that it does not knowingly employ any person who is an unauthorized alien in connection with the contracted services. {RSMo 285.530 (2)}

An Employer may enroll and participate in a federal work authorization program and shall verify the employment eligibility of every employee in the employer's hire whose employment commences after the employer enrolls in a federal work authorization program. **The E-verify system issues a Memorandum of Understanding once enrollment is complete; the City of Columbia requires a copy of this document be attached to the Work Authorization Affidavit.** The employer shall retain a copy of the dated verification report received from the federal government. Any business entity that participates in such program shall have an affirmative defense that such business entity has not violated subsection 1 of this section. {RSMo 285.530 (4)}

For offerors that are not already enrolled and participating in a federal work authorization program, E-Verify is an example of this type of program. Information regarding E-Verify is available at: http://www.dhs.gov/e-verify

EXHIBIT E, Continued
CITY OF COLUMBIA, MISSOURI
WORK AUTHORIZATION AFFIDAVIT
PURSUANT TO 285.530 RSMo
(FOR ALL BIDS IN EXCESS OF $5,000.00)

County of_____)
)SS.
State of _____)

My name is _____. I am an authorized agent of _____(Bidder). This business is enrolled and participates in a federal work authorization program for all employees working in connection with services provided to the City of Columbia. This business does not knowingly employ any person who is an unauthorized alien in connection with the services being provided. **Documentation of participation in a federal work authorization program is attached to this affidavit.**

Furthermore, all subcontractors working on this contract shall affirmatively state in writing in their contacts that they are not in violation of Section 285.530.1 RSMo and shall not thereafter be in violation. Alternatively, a subcontractor may submit a sworn affidavit under penalty of perjury that all employees are lawfully present in the United States.

_____
Affiant

_____
Printed Name

Personally appeared before me, a Notary Public, within and for the County of

_____,

State of Missouri, the person whose signature appears above, PERSONALLY AND KNOWN TO ME AND ACKNOWLEDGED, that signed the foregoing Affidavit for the purposes therein stated.

Subscribed and sworn to me this_____day of_____, 20_____.

My Commission expires_____, 20____.

_____
(Notary Public)

EXHIBIT F

MISCELLANEOUS INFORMATION

Employee/Conflict of Interest:

Offerors who are elected or appointed officials or employees of the City of Columbia or any political subdivision thereof, serving in an executive or administrative capacity, must comply with sections 105.450 to 105.458, RSMo, regarding conflict of interest. If the offeror or any owner of the offeror's organization is currently an elected or appointed official or an employee of the City of Columbia or any political subdivision thereof, please provide the following information:	
Name and title of elected or appointed official or employee of the City of Columbia or any political subdivision thereof:	
If employee of the City of Columbia or political subdivision thereof, provide name of City or political subdivision where employed:	
Percentage of ownership interest in offeror's organization held by elected or appointed official or employee of the City of Columbia or political subdivision thereof:	_____%

Registration of Business Name (if applicable) with the Missouri Secretary of State

The offeror should indicate the offeror's charter number and company name with the Missouri Secretary of State. Additionally, the offeror should provide proof of the offeror's good standing status with the Missouri Secretary of State. If the offeror is exempt from registering with the Missouri Secretary of State pursuant to section 351.572, RSMo., identify the specific section of 351.572 RSMo., which supports the exemption.

Charter Number (if applicable)	***Company Name***
If exempt from registering with the Missouri Secretary of State pursuant to section 351.572 RSMo., identify the section of 351.572 to support the exemption:	

137/2023 Addendum 1
Leidos Engineering, LLC
Supplier Response

Event Information

Number: 137/2023 Addendum 1
Title: Engineering Services: Utility Scale Battery Study
Type: Request for Qualifications
Issue Date: 9/13/2023
Deadline: 10/13/2023 05:00 PM (CT)
Notes: Qualifications may be submitted in a sealed envelope at the Purchasing Division office or uploaded electronically on this e-bidding website.

Sealed qualifications must be delivered to the Purchasing Division, 701 E. Broadway, 5th Floor, Columbia, MO 65201 by the closing date and time.

Qualifications received after the appointed time will be time stamped and marked as late. Late qualifications will not be opened and will not be considered in the evaluation.

Qualifications must be in a sealed envelope and marked in bold letters “RFQUAL 137/2023."

No fax or e-mail qualifications shall be accepted.

Contact Information

Contact: Cale Turner
Address: Finance/Purchasing
City Hall

5th Floor
City of Columbia, Missouri
701 E. Broadway, 5th Floor
Columbia, MO 65205
Phone: 1 (573) 8747375
Email: cale.turner@como.gov

Leidos Engineering, LLC Information

Address: 9400 N Broadway
Suite 300
Oklahoma City, OK 73114
Phone: (405) 478-5353
Web Address: https://www.leidos.com/engineering

By submitting your response, you certify that you are authorized to represent and bind your company.

Tyler Patton
Signature

tyler.m.patton@leidos.com
Email

Submitted at 10/12/2023 02:50:44 PM (CT)

Response Attachments

City of Columbia_BESS Study_1023.pdf

Leidos Statement of Qualifications for the RFQUAL 137/2023 Utility Scale Battery Study

CITY OF COLUMBIA, MISSOURI

Engineering Services: Utility Scale Battery Study

RFP# 137/2023

STATEMENT OF QUALIFICATIONS | OCTOBER 2023

leidos

SOLICITATION NO.: Request for Qualifications (RFQUAL) 137/2023
BUYER: Cale Turner
PHONE NO.: (573) 874-7375
E-MAIL: cale.turner@como.gov

TITLE: Engineering Services: Utility Scale Battery Study

ISSUE DATE: September 13, 2023

RETURN QUALIFICATIONS NO LATER THAN: October 13, 2023 AT 5:00 PM CENTRAL TIME (END DATE)

VENDORS ARE ENCOURAGED TO RESPOND ELECTRONICALLY THROUGH THE CITY'S E-BIDDING WEBSITE BUT MAY RESPOND BY HARD COPY (See Mailing Instructions Below)

MAILING INSTRUCTIONS: Print or type **Solicitation Number** and **End Date** on the lower left hand corner of the envelope or package. Delivered sealed qualifications must be in the Purchasing Division office (701 E. Broadway, 5th Floor) by the return qualifications date and time.

	(U.S. Mail)		(Courier Service)
RETURN QUALIFICATIONS TO:	**CITY OF COLUMBIA PURCHASING PO BOX 6015 COLUMBIA MO 65205**	**or**	**CITY OF COLUMBIA PURCHASING 701 E. BROADWAY, 5th FLOOR COLUMBIA MO 65201**

ORIGINAL CONTRACT PERIOD: Date of Award through Project Completion

DELIVER SUPPLIES/SERVICES FOB (Free On Board) DESTINATION TO THE FOLLOWING ADDRESS:

City of Columbia
Utilities Department
Columbia, Missouri

The offeror hereby declares understanding, agreement and certification of compliance to provide the items and/or services, at the prices quoted, in accordance with all requirements and specifications contained herein. The offeror further agrees that the language of this RFQUAL shall govern in the event of a conflict with their qualifications. The offeror further agrees that upon receipt of an authorized purchase order from the Purchasing Division or when a Contract/Agreement is signed and issued by an authorized official of the City of Columbia, a binding contract shall exist between the offeror and the City of Columbia.

SIGNATURE REQUIRED

VENDOR NAME Leidos Engineering, LLC	
MAILING ADDRESS 2101 CityWest Boulevard, Suite 100	
CITY, STATE, ZIP CODE Houston, TX 77042	
CONTACT PERSON Sridhar Chouhan	EMAIL ADDRESS sridhar.chouhan@leidos.com
PHONE NUMBER 304.685.2900	FAX NUMBER N/A
VENDOR TAX FILING TYPE WITH IRS (CHECK ONE) ✔ Corporation ___ Individual ___ State/Local Government ___ Partnership ___ Sole Proprietor ___IRS Tax-Exempt	
AUTHORIZED SIGNATURE Alex Kim	DATE 10/12/2023
PRINTED NAME Alex Kim	TITLE Contracts Manager

October 12, 2023

Cale Turner
Purchasing Agent
City of Columbia, Purchasing
701 East Broadway, 5th Floor
Columbia, MO 65201

Subject: **RE: RFQ 137/2023 – Engineering Services: Utility Scale Battery Study**

Dear Mr. Turner:

The City of Columbia (the City) is requesting qualifications from professional engineering firms to analyze its electrical infrastructure and make recommendations for how or if City owned utility scale batteries may impact the reliability of the electric grid and potentially move the City toward its goals of increasing renewable energy adaptation. Leidos Engineering, LLC (Leidos) is pleased to submit our qualifications in response to the above-referenced procurement.

Leidos has a history of executing successful projects with the City, namely for transmission dynamic system modeling and transient analysis for stability. Leidos is a recognized industry leader in providing power delivery services including distribution and transmission planning, renewable energy impact studies, hosting capacity studies, protection, design, capital planning, and battery energy storage studies. Our battery energy storage system experience includes battery storage techno-economic feasibility studies and technical studies to assist in determining the impacts to grid systems for a variety of use cases and applications. With our expertise in battery storage systems, we bring the experience necessary to assess system reliability and performance impacts from battery systems as well as operational aspects such as costs, safety, maintenance, degradation, augmentation, and personnel training needs. References and past project experience are provided in this RFQ that will demonstrate our unique combination of diverse skill sets and technical capabilities, prior project experience, approach, and commitment. We are confident that we will deliver high-value results for this important project and will be a trusted provider to the City.

On behalf of the firm and project team, we look forward to discussing our proposal and welcome the opportunity to provide additional support to the City. Should you have questions or require additional information, please contact Dr. Sridhar Chouhan at 304.685.2900 or sridhar.chouhan@leidos.com. We look forward to discussing this opportunity in more detail and potentially working with the City's staff on this exciting assignment.

Sincerely,
Leidos Engineering, LLC

Alex Kim
Contracts Manager

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leidos

SECTION 1

Offeror Information

Company History

The company that evolved into Leidos was founded in 1969. The company split into Leidos, a $7 billion solutions-focused business, and SAIC, a $4 billion services business in 2013. In 2016, Leidos combined with Lockheed Martin's Information Systems & Global Solutions business, doubling the size of the company. The company reported annual revenues of approximately $14.4 billion for the fiscal year ended December 31, 2022. Today, we are a global 45,000-employee enterprise committed to making the world safer, healthier, and efficient.

Leidos Engineering, LLC, a wholly owned subsidiary of Leidos, Inc., has helped utilities thrive in the dynamic energy marketplace for decades. We combine engineering, advanced technology, and business knowledge to create solutions that are sustainable today and in the future. Our highly experienced staff work alongside energy, manufacturing, and government clients to take on complexities in grid modernization, energy efficiency, project finance and development, systems and controls, and critical infrastructure protection. We have performed detailed review of over 16 GWhs of BESS projects including technology, design, construction, operations, and permitting.

Leidos Services

Leidos Engineering, LLC employs 2068 employees dedicated to performance-based integrated solutions that enable utilities to keep pace with the transforming energy market. Our teams help solve utilities' complex challenges and take on what's next through our **full life-cycle, performance-based solutions**. Our services include engineering, planning, project management, construction management, and commissioning for electric power substations and transmission and distribution lines; protection and controls and supervisory control and data acquisition (SCADA) design; and smart grid design and development. We have proven experience on projects ranging from 4 kV to 500 kV.

Leidos leverages an experienced team of engineers, systems and integration experts, financial analysts, and management consultants to plan, design, build, and integrate complete energy delivery solutions. Our project portfolio includes large energy projects across the U.S. for electric utilities, generation owners, and industrial clients. In addition, Leidos works with an established group of industry-leading construction partners to deliver meaningful energy delivery solutions.

For more information regarding Leidos' services and the nature of our business, please visit https://www.leidos.com/markets/energy

Current Contracts and Clients

Leidos works with more than 75 investor-owned utilities and more than 115 municipals/cooperatives across the country as well as a growing number of private developers. Our services include engineering, planning, project management, construction management, and commissioning for electric power substations and transmission and distribution lines; protection and controls and SCADA design; and smart grid design and development.

Contract Termination and Selection

Leidos is engaged in contracts spanning virtually every federal U.S. Government department and agency, as well as contracts with state and local governments. As part of the normal course of federal, state, and local government procurements, the government often decides to terminate a contract for its "convenience" or for reasons that have nothing to do with the contractor's performance. During its more than 54 years of existence, Leidos has received terminations for convenience or for other than cause/default in an amount consistent with the nature of a company this size. However, none of these terminations have resulted in any material effect upon Leidos' ability to perform any of its contractual obligations.

As a normal course business, Leidos delivers hundreds of proposals each year and is awarded opportunities based on the right price, quality, innovation, team/SME's, and relevant experience. For those bids where we are not selected, there is no specific trend as each client's evaluation criteria differs as does the competitive environment.

SECTION 2

Current / Prior Experience

Leidos Experience

Tables B-1 through **B-6** provide an overview of the relevant experience along with reference contact information. These reference projects are in alignment with Exhibit B of the RFQ.

Table B-1. Reference Project 1

Leidos Reference Information (Current/Prior Services Performed For:)	
Name of Reference Company/Client	Leclanché North America, LLC
Address of Reference Company/Client	Leclanché North America, Inc. 2685 Enterprise Dr. Anderson, IN 46013
Reference Contact Person Name, Phone Number, and Email Address	Bryan Urban, Senior Vice President – Americas; 214.891.5540 (office) 972.467.1694 (cell); Bryan.Urban@leclanche.com
Title/Name of Service/Contract	Caribbean Islands Photovoltaic (PV) and Battery Energy Storage System (BESS) Project
Dates of Project Initiation and Project Completion	05/07/2019 – Ongoing
If service/contract has terminated, specify reason	N/A
Description of Services Performed such as: › **What the offeror did** › **How the offeror did it** › **Results** › **Additional detail**	Leclanché North America, LLC (Leclanché) is developing and will own and operate a proposed 30 MW PV solar and 18 MW/45 MWH BESS project (the Project). The Project will provide renewable power and energy to a Caribbean island's electric system via three 11 kV express feeders and will reduce reliance on oil-fired reciprocal internal combustion engine (RICE) generators. Leclanché and the island electric utility have entered into a 20-year purchase power agreement. Leidos completed the engineering studies needed by Leclanché to prepare final design and construction of the Project. These studies included Fault Current Study, Interconnection Impact Study, Generation Protection Coordination Study, Distribution Protection Coordination Study, Harmonics Study, and conceptual design of a zigzag ground reference transformer and neutral grounding resistor (NGR). This project demonstrates design and planning for a microgrid with PV and integrated battery storage, demonstrates Leidos' ability to tailor solutions to the needs of a region greatly impacted by changing climate, and shows an example of our work outside of the Continental U.S. Leidos provided project management, electrical engineering, electrical analysis, design, and drafting services. Leidos provided electrical engineering services to perform studies and analyses. We applied experience with and understanding of electric system networks and the effect of transformer configurations on fault current, use of and settings for relays for system protection, use of zigzag transformers for grounding reference and NGRs to limit fault current, use of steady state and dynamic computer models to study the impact on the electric system for various operating conditions and faults including voltage flicker and system stability concerns associated with the reduction in RICE

Leidos Reference Information (Current/Prior Services Performed For:)

operation, and use of computer models to estimate harmonics from inverters and resonance with the electric system.

We conducted the distribution-level analysis, fault current, and protection studies using Cooper Power System's CYMDIST® software, and conducted the dynamic stability, harmonics, and resonance studies using Manitoba Hydro International Ltd PSCAD software. The studies verified compliance with IEEE Standard 1547-2018 (IEEE Standard for Interconnecting Distributed Resources with EPSs).

The distribution-level studies evaluated steady-state powerflows and voltage flicker for light and peak load conditions. The stability study analyzed a variety of system load conditions for daytime and nighttime with expected output for solar PV, BESS, and RICE facilities. Leidos reviewed the hourly system load and PV projections in developing these operating conditions for the study.

As part of our fault current and dynamic stability analysis, Leidos developed a power plant controller model in PSCAD software based on the description and logic of the EMS provided by Leclanché. We evaluated the ability of the Project to provide grid support under various outage events simulated in the study. Leidos also determined the effect of the proposed Project on the critical clearing times for faults on the island grid.

Leidos submitted study reports to Leclanché and the Caribbean islands utility that documented study assumptions, methodology, discussion of results, and Leidos recommendations. Leidos reviewed the results of the analyses via web-conference with stakeholders including Leclanché's project managers and engineers as well as the island utility's engineering department. The island government has ultimate approval of the Project.

Leidos provided the following studies and results in support of the Project:

- The Fault Current Study and Interconnection Impact Study identified the potential impacts to the electric system that would result from the interconnection and operating of the Project facilities while reducing the operation of RICE generators. One of the critical aspects studied was maintaining electric system stability for electrical faults under various operating conditions. The Impact Study also identified minimum critical clearing times for faults and determined that the Project is not expected to adversely impact thermal loading, voltage flicker, maximum and minimum voltage levels, and fault current levels.
- The Generation Protection Coordination Review and Distribution Protection Coordination Review recommended adjustments to the protective device settings to accommodate the Project facilities.
- Leidos used the results of the Fault Current Study to prepare a conceptual design for Leclanché to procure a proposed zigzag grounding transformer, in conjunction with a proposed NGR to limit fault current, which will provide a ground reference and will provide system protection for electrical faults. The conceptual design included controls to prevent simultaneous operation of the proposed NGR with an existing NGR.
- The Harmonics Study confirmed that operating the Project will result in an estimated level of harmonics that will not exceed the limits set by IEEE standards and will not cause resonance with the electric grid.
- At the additional request of Leclanché, Leidos assisted the island utility in identifying an inadvertent ground point on the electric system that was bypassing an existing NGR, resulting in excess fault current that risked damage to the RICE generators. This task was outside of the original scope, and Leidos continued the investigation until the bypass was identified and the fault risk was mitigated.

In addition to the above completed studies, Leidos will provide detailed design for installing the zigzag transformer and NGR.

Leidos Reference Information (Current/Prior Services Performed For:)	
Personnel Assigned to Service/Contract (include all key personnel and identify role	Thomas Proios (SME), Xuanchang Ran (Technical Lead), Sridhar Chouhan (QA/QC)

Table B-2. Reference Project 2

Leidos Reference Information (Current/Prior Services Performed For:)	
Name of Reference Company/Client	Marengo Battery Storage, LLC (wholly owned by Swiss Green Electricity Management Group)
Address of Reference Company/Client	Marengo Battery Energy Storage 22818 West Grant Highway Marengo, IL 60152
Reference Contact Person Name, Phone Number, and Email Address	Thom Reddington, SVP Global Operations for Stationary Storage Solutions, +1 765 610 0050, Thom.Reddington@leclanche.com
Title/Name of Service/Contract	Marengo Battery Storage Support
Dates of Project Initiation and Project Completion	March 2021 – June 2021
If service/contract has terminated, specify reason	Work complete
Description of Services Performed such as: › **What the offeror did** › **How the offeror did it** › **Results** › **Additional detail**	Leidos reviewed and analyzed the commissioning, performance testing, and final acceptance procedures for an 18 MW/19.5 MWh BESS that entered operation in 2019. Our review, conducted in 2021, was to provide an independent analysis of the BESS procedures and test results to confirm to the project owner the BESS supplier achieved its obligations for entering commercial operation. Our review included a summary of the BESS supplier's contractual obligations for commercial operation, the status of required permits, assessment of interconnection requirement completion, results from the PJM regulation qualification test, and the final site acceptance test report and data. The BESS uses lithium-ion batteries from LG Chem, power conversion from WSTech, and was integrated by LeClanché. The BESS is located outside Chicago to provide real-time frequency regulation service to the US regional transmission PJM Market. The project was initiated by GlidePath Power and then sold to SGEM, which brought the project online. Our review showed the BESS supplier had satisfactorily completed the testing and contractual obligations required for entering commercial operation, which allowed the parties to confidently move into the warranty and maintenances phase of their contracts.
Personnel Assigned to Service/Contract (include all key personnel and identify role	Mark Hardin

Table B-3. Reference Project 3

Leidos Reference Information (Current/Prior Services Performed For:)	
Name of Reference Company/Client	JEA
Address of Reference Company/Client	21 W. Church St., CC6, Jacksonville, FL 32202

Leidos Reference Information (Current/Prior Services Performed For:)	
Reference Contact Person Name, Phone Number, and Email Address	Matt Lundeen, Manager, System Analysis; 904.665.8939; lundtm@jea.com
Title/Name of Service/Contract	Solar and BESS Impact Studies
Dates of Project Initiation and Project Completion	2015-Ongoing
If service/contract has terminated, specify reason	N/A
Description of Services Performed such as: › **What the offeror did** › **How the offeror did it** › **Results** › **Additional detail**	Leidos worked with JEA to help them prepare for increased levels of renewable integration to their system. Since 2015, Leidos supported JEA in performing DER interconnection impact studies, detailed risk of islanding and transient studies, and DER interconnection policy development. In addition, Leidos has provided a DER workshop and impact study training to JEA staff to help with understanding the potential impacts, mitigation strategies, and study processes. Distribution analysis was performed in Synergi, transient analysis in PSCAD, and transmission analysis in PSS/E. Leidos performed a number of Solar and BESS interconnection studies to determine the distribution level impacts and recommended cost effective mitigations. The Synergi models for the interconnecting distribution system were updated with the proposed projects and the latest information provided by JEA. The analysis included evaluation of voltage regulation, voltage flicker, thermal loading, reverse power flow, short circuit and protection coordination, effective grounding, and risk of islanding. The impact studies are performed following IEEE-1547 Standard (IEEE Standard for Interconnection and Interoperability of DERs with Associated EPSs Interfaces) and JEA interconnection requirements. As part of the studies, Leidos provided training workshops to JEA engineers on DER and BESS interconnection studies, detailed voltage flicker studies following IEEE-1453 and IEC-61000 standards, study methods, and industry best practices and standards. The distribution impact studies flagged the need for detailed transient studies in PSCAD to study risk of islanding, TOV due to load rejection and ground fault cases, and transformer inrush. The transient analysis was conducted by using the manufacturer provided detailed models of inverters in PSCAD. The PSCAD models were developed using the distribution system information such as line impedances, unbalanced loads, load connections, source impedance, station transformer, capacitors, regulators, reclosers, and existing and approved DER from Synergi models. The transformer inrush study was conducted using the Multiple-Run function in PSCAD to capture the worst-case inrush current and voltage dip associated with it.
Personnel Assigned to Service/Contract (include all key personnel and identify role	Ran Xuanchang (Technical Lead – EMT and Transmission Studies), Sridhar Chouhan (Technical Lead – Distribution Studies)

Table B-4. Reference Project 4

Leidos Reference Information (Current/Prior Services Performed For:)	
Name of Reference Company/Client	Bermuda Electric Light Company (BELCO)
Address of Reference Company/Client	27 Serpentine Road HM 07, Bermuda

Leidos Reference Information (Current/Prior Services Performed For:)	
Reference Contact Person Name, Phone Number, and Email Address	Benson Phillip, Engineering Manager; +1 441 295 5111; BPhillip@belcom.com
Title/Name of Service/Contract	BELCO BESS Implementation
Dates of Project Initiation and Project Completion	March 2018-April 2019
If service/contract has terminated, specify reason	Work Complete
Description of Services Performed such as: › **What the offeror did** › **How the offeror did it** › **Results** › **Additional detail**	Leidos was BELCO's owner's engineer for development and installation of Bermuda's first major grid-connected energy storage project. The BESS serves as a flexible resource, primarily for replacing existing oil-fired reciprocating engines that provide spinning reserve capacity. BELCO's energy storage strategy grew out of Leidos' integrated resource plan (IRP) for the utility, which involved a broad evaluation of conventional, renewable, and other resources to fulfill Bermuda's electric power needs. The solution is based on a fast-response lithium-ion system, which has an output capacity of 10 MW for 30 minutes. The BESS came fully assembled in corrosion-resistant shipping containers housing battery cells (SAFT technology, NCA chemistry), inverters, controllers, relays, fans, and a fire suppression and detection system. Separate power conversion system containers and transformers were also part of the turnkey package. Projected annual fuel cost savings of $2 million correspond to a payback period of four years, less than a quarter of the system's expected 20-year operating life. The BESS also reduces carbon dioxide emissions by at least 400 tons per month. As owner's engineer, Leidos developed a performance specification and request for proposal; assisted with selection of partners and technologies; and monitored construction, commissioning, and testing. Our team defined use cases for the storage system and translated operational needs into a detailed requirements definition. Leidos augmented BELCO staff by managing the proposal and vendor management process. We guided the selection of a preferred partner based on project-specific selection criteria and supported BELCO's recommendation to the utility regulator. Our efforts during the construction, commissioning, and testing phases monitored and confirmed compliance with the construction contract and industry standards. The project entered commercial operation in April 2019.
Personnel Assigned to Service/Contract (include all key personnel and identify role	N/A

Table B-5. Reference Project 5

Leidos Reference Information (Current/Prior Services Performed For:)	
Name of Reference Company/Client	Caribbean Utilities Company Limited (CUC)
Address of Reference Company/Client	457 North Sound Road Grand Cayman KY1-1101 Cayman Islands
Reference Contact Person Name, Phone Number, and Email Address	Wesley Cullum; 345.914.1904; WCullum@cuc.ky

Leidos Reference Information (Current/Prior Services Performed For:)	
Title/Name of Service/Contract	BESS Feasibility Study and Procurement Support
Dates of Project Initiation and Project Completion	January 2020 – June 2021
If service/contract has terminated, specify reason	Work Complete
Description of Services Performed such as: › **What the offeror did** › **How the offeror did it** › **Results** › **Additional detail**	CUC desired to install utility-scale battery systems at three of its existing substations, comprising a 10 MW/10 MWh BESS at one location and 5 MW/5 MWh systems at two. The primary objective of the installations was to provide a reliable replacement for the spinning reserve now provided by fossil-fuel-fired generators, thus reducing system fuel cost. In addition, the project was intended to improve system reliability due to its much faster reaction time in comparison to the generators and lessen the risk of customer outages associated with generator trips. Leidos' owner's engineering services supported the project in its early phases including a feasibility study and procurement support. The feasibility phase entailed development of an economic and system performance model using Homer Pro micro grid software to optimize the economic performance of the project while minimizing the initial investment. Inputs include existing generation performance and cost, anticipated future load and sizing of future generation as identified in the utility's IRP, sizing of the BESS, and BESS performance assumptions based on Li-ion energy storage solution and solar PV technologies. Leidos first validated the model and performed an initial simulation to optimize sizing and then refined the model and performed simulations including load forecast sensitivity, fuel price sensitivity, and generation portfolio and dispatch alternatives. Upon completing the feasibility study portion, Leidos assisted with preparation of the RFPs for the engineering, design, procurement, construction, and commissioning and testing of the BESS. Leidos also supported CUC during the proposal evaluation phase including review of vendor's technical proposals and development of proposal scoring.
Personnel Assigned to Service/Contract (include all key personnel and identify role	N/A

Table B-6. Reference Project 6

Leidos Reference Information (Current/Prior Services Performed For:)	
Name of Reference Company/Client	Central Hudson Gas and Electric (CHGE)
Address of Reference Company/Client	284 South Avenue, Poughkeepsie, New York 12601- 4879
Reference Contact Person Name, Phone Number, and Email Address	Adam Podpora; 845.486.5866; APodpora@cenhud.com
Title/Name of Service/Contract	BESS Interconnection Impact Studies
Dates of Project Initiation and Project Completion	January 2017 - Ongoing
If service/contract has terminated, specify reason	N/A
Description of Services Performed such as:	Leidos has been working with CHGE for over six years on DER interconnection impact studies, performing over 50 coordinated electric system interconnection

Leidos Reference Information (Current/Prior Services Performed For:)	
› **What the offeror did** › **How the offeror did it** › **Results** › **Additional detail**	review (CESIR) studies in the last three years. In addition, Leidos has provided CHGE with eight BESS interconnection studies. These BESS range from 20 MVA to 25 MVA capacity and required transmission-level analysis in addition to distribution analysis. Ongoing studies typically include short-circuit, voltage limit violations, voltage flicker, thermal overload, voltage regulation and capacitor switching requirements and settings, review of protection and grounding, and transmission-level power flow and stability analyses, as applicable. Study results include a summary of system and site improvements required to successfully interconnect the proposed project to the system, as documented on the NYS CESIR report template. Leidos works with CHGE to determine the acceptable range of system improvements to be applied. The transmission-level analysis consisted of powerflow and dynamic stability analyses. Using Multiregional Modeling Working Group power system models representing the CHGE and New York Independent System Operator systems as a baseline, we developed powerflow and dynamic models based on data and information provided by the Interconnection Customer and CHGE. The BESS project was added to the baseline models for purposes of the analyses. Leidos simulated a number of disturbance events for the steady-state and transient periods of the study, and we evaluated the CHGE system response to the addition of the BESS. The interconnection analysis is primarily performed in WindMil, LightTable®, ASPEN OneLiner, and PSS/E. The impact studies are performed following IEEE-1547 Standard (IEEE Standard for Interconnection and Interoperability of DERs with Associated Electric.)
Personnel Assigned to Service/Contract (include all key personnel and identify role	Elizabeth Hames (Technical Lead) and Sridhar Chouhan (QA/QC Lead)

Additional Experience

The following projects provide additional project experience to speak to our team's abilities to provide battery energy studies, including topics such as load shedding, BESS implementation and testing, and BESS technology evaluation. We have also provided an example of our design and construction services, of which we regularly perform for substations, distribution, and transmission facilities.

Project Electrodes Energy Storage System

Macquarie Capital (USA) Inc. (CIT Group, Rabobank, Sumitomo Mitsui Banking Corporation, and ING), California

Leidos acted as independent engineer to assist Macquarie in its participation in a portfolio of behind-the-meter battery energy storage facilities in the West Los Angeles Basin (Los Angeles and Orange counties). Our services commenced in 2016 with Macquarie's acquisition of the project and included diligence reviews for numerous debt financings to incrementally fund the project's implementation from 2017 to 2019. The project's initial debt financing was a first-of-its-kind project financing of distributed BESS.

The Electrodes project consists of approximately 90 energy storage systems installed at host facilities on the Southern California Edison (SCE) grid. The hosts are large-load commercial, industrial, and government facilities. The systems have a design capacity of 63 MW/ 340 MWh to provide up to 50 MW of demand energy reduction for up to four hours to SCE and demand peak reduction of up to two hours to each site host. Hosts benefit from lower electrical costs due to peak shaving, and the project generates revenues from the hosts and SCE via Demand Response Energy Storage Agreements (DRESA).

Revenues associated with California Public Utilities Commission's Self-Generation Incentive Program and Automated Demand Response program also contribute to the project economics.

Leidos also provided ongoing construction monitoring and performance testing during the three-year buildout of the project ending in late 2020. These services included verifying that design including any change in design implemented during construction, was in general compliance with the requirements of the host agreements, DRESAs, and applicable incentive programs; verifying compliance with material permits; and reviewing the progress of engineering for compliance with the project schedule. We also reviewed the status of delivery commitments associated with the major procurement contracts, conducted reviews of the written construction and operation safety plan, reviewed the proposed work and quality assurance/quality control plans, and conducted monthly site visits to the facilities in construction.

Pine Hill Substation Upgrades

Orlando Utilities Commission, Florida

Leidos provided engineering services for the replacement of the six 115 kV oil circuit breakers at Pine Hills substation. This included substation, structural, foundation, P&C design, and relay settings services. We replaced the existing oil circuit breakers with new SF6 circuit breakers, as well as replaced the 16 existing 115 kV 2000A vertical break disconnects with new 3000A vertical break disconnects. As we upgraded the existing breaker control relays, we updated them to OUC's latest standards. Our team also calculated relay settings for the new breaker control relays. We provided preliminary engineering to develop project options, perform civil-structural analysis and assessments, and prepare a work package that minimized unknowns for development of a comprehensive and reasonably accurate project budget and schedule. Once the project was approved by OUC's Board of Commissioners, Leidos began the detailed design phase. During the detailed design phase, Leidos prepared detail drawings and provided OUC's Procurement Department with a material list for procurement of materials and equipment. Leidos also developed a construction bid package, coordinated the construction contract, and provided oversight and engineering support during construction. Leidos achieved the required in-service date of May 2021.

In working on this project, the original substation spacings were optimized for 115 kV clearances. The breakers that were procured for this scope were rated at 138 kV. Leidos worked closely with the disconnect switch manufacturer to mitigate clearance issues caused by the increase in voltage rating.

Based on the above challenges, this was the first installation using a higher rated breaker and a new disconnect switch vendor. Leidos was able to support by updating the OUC standard equipment installation procedures for future breaker replacements.

Diablo BESS

Confidential Client

Leidos provided an independent engineering review and verification that client's 200 MW, 800 MWh of the BESS achieved the requirements of commercial operation in accordance with the terms of the offtake agreement with another entity. This required reviewing the detailed project design, construction documentation, commissioning test reports, and witnessing the BESS performance tests to make sure the BESS achieved the performance metrics required under the offtake agreement.

BESS Procurement Support

Confidential Client

Leidos provided owner's advisory support to the client in support of the client's BESS equipment supplier and technology evaluation for BESS to be installed with commercial scale solar PV projects. Leidos developed a form request for information and process for performing technical due diligence on a target BESS supplier. Leidos also created a tool for the client's use in evaluating and comparing BESS supplier proposals for specific projects based on the commercial and technical aspects of the BESS supplier's offer. The tool included evaluation of key BESS performance metrics, such as round-trip efficiency, battery degradation, auxiliary loads, and usable AC energy assessed against the requirements of a specific project. Leidos supported the client in implementing the technical diligence process and comparison tool and provided an independent letter report summarizing the diligence performed and BESS evaluation for use by the client in their internal procurement review processes.

SECTION 3

Expertise of Key Personnel

Key Personnel

As requested, the tables provided in Exhibit C of the RFQ have been copied here and represent the experience of the key personnel being proposed for the work for the City. Should the City desire additional information, Leidos can provide a resume for each individual.

Program Manager	
Name of Person:	Sridhar Chouhan, Ph.D., P.E.
Educational Degree(s): include college or university, major, and dates	› Ph.D. in Electrical Engineering, West Virginia University (2017) › M.S. in Electrical Engineering, West Virginia University (2009) › Bachelor of Technology in Electrical and Electronics Engineering, Jawaharlal Nehru Technological University (2006)
License(s)/Certification(s), number(s), expiration date(s), if applicable	› Professional Electrical Engineer: WV (021106, Exp. 12/31/2024)
Specialized training completed	› None
Number of years' experience in area of service proposed to provide	15 years of experience in the power sector in T&D planning and advanced technology research
Describe person's relationship to offeror. If employee, number of years. If subcontractor, describe other/past working relationships	Has been with Leidos for 15 years.
Describe the person's responsibilities over the past 12 months	He is a subject matter expert on smart grid technologies, such as conservation voltage reduction, distribution automation (DA), renewable energy, BESS, and microgrids. He supported various T&D planning and distributed generation (DG) interconnection projects and specializes in developing models and performing studies for load flow, short-circuit, protection and coordination, voltage optimization, load rejection overvoltage, transformer in-rush, and stability. Dr. Chouhan has expertise in modeling and simulation of distribution systems, transmission systems, and power markets using different power system software that includes CYME®, Synergi®, Windmil®, ETAP®, ASPEN®, DEW®, MATLAB®, Simpower®, MATPOWER, OpenDSS®, GridLab-D™, PowerWorld®, Distributed Energy Resources Customer Adoption Model (DER-CAM), HOMER, and PSCAD®.
Previous employer(s), positions, and dates	› None
Staffing Methodology	
Describe the person's planned duties/role proposed herein	Dr. Chouhan will oversee the overall project execution and provide SME support on BESS technology evaluation, business case development, and technical studies.

Project Manager	
Name of Person:	Sebnem Tezsezen, PMP
Educational Degree(s): include college or university, major, and dates	› M.S. in Information Systems (E-Commerce), Claremont Graduate University (2001) › M.S. in Industrial Engineering (Systems Management Track), Middle East Technical University, Turkey (2000) › B.S. in Industrial Engineering, Middle East Technical University, Turkey (1998)
License(s)/Certification(s), number(s), expiration date(s), if applicable	› Project Management Professional (PMP), Project Management Institute (2127536, exp. 27 December 2023)
Specialized training completed	› Project management, strategy and communications related trainings
Number of years' experience in area of service proposed to provide	21 years of experience providing project management, technical and management consulting, and services primarily to electric utilities.
Describe person's relationship to offeror. If employee, number of years. If subcontractor, describe other/past working relationships	Has been with Leidos for 21 years.
Describe the person's responsibilities over the past 12 months	Ms. Tezsezen serves as project manager and subject matter expert on multiple projects. Her expertise includes data, process, system, and technology analyses; planning, implementation, cost/benefit and return on investment analyses; project prioritization; and scheduling. She supports electric system technology, asset management and planning efforts; load/loss analyses; and helps develop long-range utility capital/operations and maintenance plans and technology roadmaps.
Previous employer(s), positions, and dates	› MIKES Microwave Electronic Systems, Inc., Buyer, 1998 – 2000
Staffing Methodology	
Describe the person's planned duties/role proposed herein	Ms. Tezsezen will perform project management and resource/workload management

Technical Advisor	
Name of Person:	Thomas Proios, P.E.
Educational Degree(s): include college or university, major, and dates	› B.S. in Electrical Power Engineering, Rensselaer Polytechnic Institute (1973)
License(s)/Certification(s), number(s), expiration date(s), if applicable	› Professional Electrical Engineer: Alabama (39017, Exp. 12/31/23), Arkansas (19451, Exp. 12/31/23), CA (23231, Exp. 06/30/24), CT (26002, Exp. 01/31/24), FL (65934, Exp. 02/28/25), GA (PE045492, Exp. 12/31/24), IL (062-044582, Exp. 11/30/23), IN (PE11600594, Exp. 07/31/24), KY (25014, Exp. 06/30/24), LA (44398, Exp. 09/30/24), MD (38650, Exp. 04/20/24), MA (47064, Exp. 06/30/24), MI (6201029391, Exp. 08/26/25), MS (30782, Exp. 12/31/23), MO (PE-2003016700, Exp. 12/31/23), NV (23696, Exp. 12/31/23), NH (12138, Exp. 09/30/24), NY (089827-1, Exp. 08/31/25), NC (33685, Exp. 12/31/23), OH (81574, Exp. 12/31/23), OK (23039, Exp. 11/30/24), OR (83060PE, Exp. 12/31/24), PA (PE078566, Exp. 09/30/25), SC (26241, Exp. 06/30/24), TN (111310, Exp. 02/28/25), TX (103134, Exp. 03/31/24), WA (45480, Exp. 09/15/25), WI (26093-006, Exp. 07/31/24)

Technical Advisor	
Specialized training completed	› Member IEEE Power and Energy Society, working groups for standards
Number of years' experience in area of service proposed to provide	49 years of experience in the design and QC of complex electrical systems in the utility industry.
Describe person's relationship to offeror. If employee, number of years. If subcontractor, describe other/past working relationships	Has been with Leidos for 22 years.
Describe the person's responsibilities over the past 12 months	Mr. Proios serves as an engineer-in-charge, providing staff guidance, review, and approval of calculations for grounding, lightning protection, alternating current and direct current station service, rigid bus design per IEEE-605 guide, voltage drop, and conduit fill; overseeing quality reviews on multi-disciplinary projects including projects involving design and analysis of renewable and BESS installations; and sealing client "for construction" documents.
Previous employer(s), positions, and dates	› Duke Engineering & Services (Electrical & I&C Manager) /Vectra Technologies (Lead Engineer) / ABB Impell (Supervising Engineer) (1990-2001) › Stone & Webster Engineering (Construction Engineer, Startup Engineer) (1973-1990)
Staffing Methodology	
Describe the person's planned duties/role proposed herein	Mr. Proios will support the BESS study as a subject matter expert, providing technical advice as needed to our team and providing signing and sealing of the final report.

Impact Studies Lead	
Name of Person:	Elizabeth Hames, Ph.D., P.E.
Educational Degree(s): include college or university, major, and dates	› Ph.D. in Electrical Engineering, Texas Tech University (2014) › M.S. in Electrical Engineering, Texas A&M University (2011) › B.S. in Electrical Engineering, Texas A&M University (2009)
License(s)/Certification(s), number(s), expiration date(s), if applicable	› Professional Electrical Engineer: AZ(64002, Exp. 6/30/2024), CA(21934, Exp. 9/1/2024), NM(25013, Exp. 12/31/2023), OK(29394, Exp. 3/31/2024), TX(124956, Exp. 9/1/2024)
Specialized training completed	› Siemens PSSE Training, SEL Relay Settings Training
Number of years' experience in area of service proposed to provide	Nine years of professional experience in electrical engineering
Describe person's relationship to offeror. If employee, number of years. If subcontractor, describe other/past working relationships	Has been with Leidos for two years

Impact Studies Lead	
Describe the person's responsibilities over the past 12 months	Her work has been focused on distribution and transmission system analysis, which includes short-term and long-term planning studies, renewable energy impact studies, BESS impact studies, load forecasting, protection and coordination studies, arc flash studies, and distribution line design. Clients have included cooperatives, municipals, oil and gas, private facilities, and generation plants. Dr. Hames has expertise in modeling and simulation of distribution systems, transmission systems, and power markets using different power system software that includes CYME®, Synergi®, WindMil®, ETAP®, ASPEN®, PSS/E, and SKM PowerTools.
Previous employer(s), positions, and dates	› SGS Engineering, LLC (2014-2021)
Staffing Methodology	
Describe the person's planned duties/role proposed herein	Dr. Hames will lead the BESS impact studies, load forecasting, and mitigation development including T&D grid upgrades.

Impact Studies Associate	
Name of Person:	Alex Radulescu
Educational Degree(s): include college or university, major, and dates	› B.S. in Electrical Engineering, University of Florida (2019)
License(s)/Certification(s), number(s), expiration date(s), if applicable	› Certified Electrical Engineer-in-Training: FL (NCEES ID: 20-081-76 / Engineering Intern # 1100024065, exp. N/A)
Specialized training completed	› N/A
Number of years' experience in area of service proposed to provide	Three years of experience in electrical engineering for the utility industry
Describe person's relationship to offeror. If employee, number of years. If subcontractor, describe other/past working relationships	Has been with Leidos for three years.
Describe the person's responsibilities over the past 12 months	He performs distributed energy resource (DER) interconnection impact studies and coordination and arc flash assessments. Mr. Radulescu has expertise in modeling and simulation of distribution systems using different power system software that includes CYME®, Synergi®, Windmil®, ETAP®, and SKM PowerTools.
Previous employer(s), positions, and dates	› SpinCore Technologies, Inc. – Technical Associate (2012 – 2014) › NDI Recognition Systems – Intern, Technical Associate (2014 – 2017) › Geek Squad – Consultation Agent (2018 – 2019) › Novanta, Inc. – Biomedical Equipment Technician (2019 – 2020)
Staffing Methodology	
Describe the person's planned duties/role proposed herein	Mr. Radulescu will provide engineering support for steady state analysis of the BESS.

Transient Studies Lead	
Name of Person:	Xuanchang Ran, Ph.D., P.E.
Educational Degree(s): include college or university, major, and dates	› Ph.D. in Electrical Engineering, New York University (2014) › M.S. in Electrical Engineering, New York University (2010) › B.S. in Electrical Engineering, Southwest Jiaotong University (2008)
License(s)/Certification(s), number(s), expiration date(s), if applicable	› Professional Electrical Engineering – Power Engineer: CA (E23510, exp. 06/30/2025)
Specialized training completed	› None
Number of years' experience in area of service proposed to provide	Nine years of working experience in large-scale transmission and distribution (T&D) system transient and load flow modeling and simulation including relay operation study, short-circuit analysis, load flow study, stability analysis, and extensive research on positive/negative impact of distributed generation penetration.
Describe person's relationship to offeror. If employee, number of years. If subcontractor, describe other/past working relationships	Has been with Leidos for eight years.
Describe the person's responsibilities over the past 12 months	Conducts technical studies with many different T&D analysis programs including ElectroMagnetic transients program (EMTP), PSCAD®, General Electric's Positive Sequence Load Flow® (PSLF®), Siemens' Power System Simulation for Engineering (PSS®E (PSS/E)), Operation Technology, Inc.'s electrical transient and analysis program®, computer-aided protection engineering (CAPE), and Advanced Systems for Power Engineering, Inc.® (ASPEN).
Previous employer(s), positions, and dates	› Con Edison, Engineer Intern (distribution department) (2013 – 2014)
Staffing Methodology	
Describe the person's planned duties/role proposed herein	Dr. Ran will lead the BESS transient studies.

Transient Studies Lead	
Name of Person:	Wael Radwan
Educational Degree(s): include college or university, major, and dates	› M.S. in Electrical Engineering, University of Windsor, 2021 › B.S. in Electrical Engineering, University of Windsor, 2014
License(s)/Certification(s), number(s), expiration date(s), if applicable	› N/A
Specialized training completed	› Electromagnetic transients (EMT) Boot Camp by NERC
Number of years' experience in area of service proposed to provide	Four months work experience and four years of academic research work
Describe person's relationship to offeror. If employee, number of years. If subcontractor, describe other/past working relationships	Has been with Leidos for four months.

Transient Studies Lead	
Describe the person's responsibilities over the past 12 months	He has performed transient studies for battery storage systems and interconnection reviews for PV systems for utilities. He has performed low voltage arc flash assessments for wastewater treatment facilities. Mr. Radwan has expertise in modeling and simulation of distribution systems, transmission systems, and power markets using different power system software that includes CYME®, Synergi®, WindMil®, ETAP®, and PSCAD®.
Previous employer(s), positions, and dates	› General Motors, Controls Engineer, 2021-2022 › Fibro Laepple Technology, Electrical Designer, 2016-2021 › Radix, Electrical Designer, 2015-2016
Staffing Methodology	
Describe the person's planned duties/role proposed herein	Mr. Radwan will provide engineering support for transient analysis of the BESS.

Transient Studies Associate	
Name of Person:	Anushree Pethe
Educational Degree(s): include college or university, major, and dates	› M.S. in Electrical Engineering, Arizona State University (2015) › B.S. in Electrical Engineering, University of Mumbai (2013)
License(s)/Certification(s), number(s), expiration date(s), if applicable	› N/A
Specialized training completed	› Professional Engineer (PE), FL: Passed (awaiting license)
Number of years' experience in area of service proposed to provide	Seven years of experience in the field of power system engineering
Describe person's relationship to offeror. If employee, number of years. If subcontractor, describe other/past working relationships	Has been with Leidos for five years
Describe the person's responsibilities over the past 12 months	Conducts technical studies with many different transmission analyses and engineering programs including Siemens' Power System Simulator (PSS®E (PSS/E) and PSS®MUST), computer-aided protection engineering (CAPE), and PowerGEM Transmission Adequacy and Reliability Assessment (TARA).
Previous employer(s), positions, and dates	› Open Access Technology International (OATI): (2015-2019)
Staffing Methodology	
Describe the person's planned duties/role proposed herein	Ms. Pethe will provide engineering support for transient analysis of the BESS.

Technical Feasibility Lead	
Name of Person:	Mark Hardin
Educational Degree(s): include college or university, major, and dates	› M.S. in Business Administration, University of Texas at Austin (2011) › B.S. in Mechanical Engineering, University of California (2004)

Technical Feasibility Lead	
License(s)/Certification(s), number(s), expiration date(s), if applicable	› N/A
Specialized training completed	› N/A
Number of years' experience in area of service proposed to provide	More than a decade of direct experience in the battery energy storage industry and a combined 15 years in engineering.
Describe person's relationship to offeror. If employee, number of years. If subcontractor, describe other/past working relationships	Has been with Leidos for three years
Describe the person's responsibilities over the past 12 months	Focused on evaluating battery storage technologies and the unique commercial propositions of energy storage installations, both alone and in combination with solar power.
Previous employer(s), positions, and dates	› NEC Energy Solutions, Director Commercial Operations (2014 – 2020) › Younicos, Director Product Marketing, (2013-2014) › Xtreme Power, Director Sales Engineering (2009-2013)
Staffing Methodology	
Describe the person's planned duties/role proposed herein	Mr. Hardin will lead the BESS portions of the project including BESS sizing analyses, technical evaluation, and cost estimation.

Technical Feasibility Associate	
Name of Person:	Vishal Shah
Educational Degree(s): include college or university, major, and dates	› M.S. in Mechanical Engineering (Energy Systems), Columbia University (2017) › B.S. in Mechanical Engineering, Nirma University (2016)
License(s)/Certification(s), number(s), expiration date(s), if applicable	› N/A
Specialized training completed	› N/A
Number of years' experience in area of service proposed to provide	More than five years of industry experience focused on battery energy storage systems (BESS), distributed generation, and the U.S. power markets
Describe person's relationship to offeror. If employee, number of years. If subcontractor, describe other/past working relationships	Has been with Leidos for one year.
Describe the person's responsibilities over the past 12 months	Focuses on evaluating battery storage technologies and the technical, commercial, and financial risks and rewards associated with BESS projects, either standalone or in combination with other renewable technologies
Previous employer(s), positions, and dates	› Sol Systems, Sr. Manager of Energy Storage (2021 – 2022) › Enel X North America, Solutions Engineer, (2018-2021) › Customized Energy Solutions, Load Analyst (2017-2018)

Technical Feasibility Associate	
Staffing Methodology	
Describe the person's planned duties/role proposed herein	Vishal shall support the BESS sizing analyses, technical evaluation, and cost estimation of the project.

Electrical Design Lead	
Name of Person:	Muna Anazodo
Educational Degree(s): include college or university, major, and dates	› M.S. in Engineering, University of Waterloo, Canada (2015) › B.S. in Electrical Engineering, University of Windsor, Canada (2009)
License(s)/Certification(s), number(s), expiration date(s), if applicable	› Professional Electrical Engineer: Canada
Specialized training completed	› N/A
Number of years' experience in area of service proposed to provide	14 years of experience in protection and controls (P&C), AC and DC station service, and special protection systems design
Describe person's relationship to offeror. If employee, number of years. If subcontractor, describe other/past working relationships	Has been with Leidos for two years
Describe the person's responsibilities over the past 12 months	Mr. Anazodo currently manages the substation design group in the Northern region of the U.S. He previously provided detailed engineering leadership and oversight on several projects in the National Grid New York portfolio including the following: National Grid IT ODS upgrade projects, Geres Lock Breaker replacement, and 34.5 kV Upgrades Machias. Mr. Anazodo's role and responsibilities include making sure client expectations are met or exceeded in respect to quality, cost, schedule, and design implementation.
Previous employer(s), positions, and dates	› Hydro One (2009 – 2021); ATCO Power (2007)
Staffing Methodology	
Describe the person's planned duties/role proposed herein	Mr. Anazodo will provide overview of electrical substation design.

SECTION 4

Method of Performance

Benefit to the City

Leidos is recognized as an industry leader in power delivery services including distribution and transmission system planning and utilities consistently turn to us for high-quality expertise. Our power delivery staff of over 2060 employees provide the depth of engineering professionals with the required knowledge and experience in power system planning, design, operations, and maintenance. Leidos offers our clients an efficient approach to grid planning—drawing from our full-service expertise in civil/structural and electrical engineering, thus saving our clients time and money.

Leidos has successfully completed several battery storage techno-economic feasibility studies and technical studies to determine grid interconnection impacts and help design battery storage systems for variety of use cases and applications.

Leidos brings the following benefits to the City and to the project:

Battery Energy Storage System (BESS) Expertise. Leidos has performed and supported a range of planning-related and BESS services for utilities like City of Columbia for more than 10 years. Our technical study experience includes performing steady-state and transient studies for BESS interconnections in grid-connected and microgrid-islanded modes of operation following industry best practices and Distributed Energy Resource (DER) and microgrid standards. In the past two years alone, Leidos has performed technical due diligence for over 16 GWh of BESS projects including projects AC-coupled or DC-coupled with solar photovoltaic and standalone BESS projects. Our BESS experience spans from residential to commercial to some of the largest utility scale BESS in operation today. Leidos has experience with diverse set of distribution and transmission analysis software including CYME®, Milsoft's WindMil®, Synergi®, ETAP®, PSS®E, PSLF, and Electrical Distribution Design, Inc.™ DEW; and electromagnetic transient analysis software including PSCAD® and EMTP®. Based on our understanding of the City's needs and our experience on similar projects with other utilities, Leidos is well-suited to successfully meet the City's BESS planning needs.

Collaborative Support. Listening to our clients' concerns and identifying specific needs and unique challenges our clients face allows our team to create efficient, valuable, and successful client-focused strategies, such as encouraging problem solving through team collaboration providing increased productivity and efficiency. We have successfully proven this collaborative approach through our work with other utilities.

Experienced Staff. Leidos will support the City with a dedicated, cohesive team of key staff and draw upon the engineering and design professionals from other Power Delivery Solutions and Energy and Infrastructure Consulting design centers as needed. Leidos' team of engineers provide a diverse and competitive skillset that is reflected in the quality of their work products. Our engineers are actively engaged in the Institute of Electrical and Electronics Engineers Power and Energy Society

subcommittees and working groups to provide thought leadership with upcoming standards development in distribution planning, DER interconnections, and microgrid areas. Leidos engineers have provided several training workshops to our utility clients on DER/BESS interconnection and microgrid study processes, methods, and standards.

Overview

The City desires utility scale battery energy storage systems that can support the City's goal to increase renewable energy adaptation. The City needs to determine the technical feasibility, reliability impacts, costs, and operational aspects of a BESS on either their 69 kV or 13.8 kV substation levels in the City's substations.

Evaluating storage opportunities is a challenging exercise involving expertise in dispatch and production cost modeling and transmission and distribution (T&D) system power flow analysis, as well as a thorough understanding of the cost and performance characteristics of the universe of available storage technologies. Coupling this complexity with the varying types of financial arrangements available for a given project results in even more combinations of potential deployments. The primary purpose for this project is to evaluate the benefits and limitations to the City for battery systems and determine if utility scale batteries could assist the utility in reaching their renewable energy adaptation goals.

The Project will consist of the following two tasks:

- **Stage-1.** BESS Operational Study including cost analysis, maintenance procedures, safety concerns, personnel considerations,
- **Stage-2.** Studies to confirm technical feasibility, impacts, and required T&D upgrades of BESS systems in different use cases.

The project execution approach is described within the following sections.

Data Request and Kick-off Meeting (Meeting #1)

Data Request and Review

The City has indicated in the Scope of Services that they will provide the following input data for the study:

- Historical load data
- Load forecasting data
- Existing model developed by the City to perform simulations, such as PSSE or other suitable software
- Transmission and distribution contingencies
- Schematics of existing substations

Leidos will formally request additional data needed for modeling and analysis from the City to begin work and to proceed with developing an operational model of the City electric distribution system. Leidos will prepare a secure FTP site for transfer of project data to limit large file transfers via hard electronic media or large e-mail file transfers.

The data request will include, but is not limited to:

- Known areas with voltage or loading concerns on the study distribution feeders
- Strategies and assumptions to deal with missing, inaccurate, or conflicting data
- Load allocation criteria for the model if model is not already allocated
- Locations and available power output ratings (kW) of known existing or forecasted areas likely to adopt utility-scale distributed energy resources
- Results of recent field investigations concerning voltage, current and phase balance, information on power factor of the system, and distinct areas of the system
- Historical supervisory control and data acquisition (SCADA) data for the substation power transformers and feeder breakers including kW and, where available, kVAR loads, amps, voltage
- Metered demand for large customers during the summer and winter system peak months, if model is not already allocated

Once data has been received, Leidos will review the data provided to identify the data gaps and, if required, request additional data needed to update the electric system model. Leidos will identify model development gaps from information contained within the data. This process will be iterative, but Leidos will provide the information requests with sufficient advance notice to prevent delays in project execution.

Kick-off Meeting (Meeting #1)

Leidos will facilitate a two-hour virtual meeting with the project team and the City staff to discuss to following topics related to the Project:

- Project Management
  - Project schedule
  - Leidos and the City staff responsibilities and project tasks
  - Data requests
- Study Scope and Goals
  - Model extents, assumptions, and needed updates
  - Discussion of anticipated load growth in terms of EV and other spot loads
  - Existing and forecasted DER
  - BESS modeling, application, and use cases
  - Loading scenarios to be considered in the analyses
  - Analyses to be conducted
  - Establish system operating requirements for evaluating capacity and voltage levels
  - Reporting content and format
  - The City’s requirements to participate in the MISO market
  - Plans for black-start and system restoration

BESS Operational Analysis

Leidos will provide an operational analysis, including estimated capital and operating costs, an overview of expected maintenance procedures, BESS safety considerations, and expected personnel requirements of a BESS for the following scenarios:

Interconnection Scenarios:

1. Replacing the City's aging 14 MW combustion gas turbine with a utility scale BESS located at the City's municipal power plant. The analysis will evaluate a BESS connected to the 13.8 kV bus providing peak shaving services in support of the distribution load at the substation in times of high usage.
2. Installing a distribution level utility BESS at a substation nearing capacity of its substation level to provide distribution level peak shaving services and potentially defer capital costs associated with increasing the capacity of the substation.
3. Installing a transmission level utility BESS at a substation requiring additional transmission capacity to provide transmission level peak shaving services and potentially defer capital costs associated with increasing the capacity of the substation.

Ownership Scenarios:

1. Utility Owned
2. Third Party Owned

A comparison will be provided to assist the City in selecting the placement of and ownership of a BESS. The operation analysis will consist of the following tasks.

Costs

Leidos will evaluate the estimated capital and operational expenses to the City for procurement, installation, and operation of the BESS for each interconnection scenario. Leidos will compare the total cost of ownership of the BESS installation to the alternative associated with not installing the BESS to evaluate the net benefit.

Maintenance

Leidos will provide a high-level summary of the maintenance procedures for operating a BESS.

Safety

Leidos will provide a summary of the safety considerations for BESS installations based on industry best practices to support the City in informing involved for personnel and residents.

Personnel

Leidos will provide recommendations for personnel positions and training for specialized service to utility scale BESS.

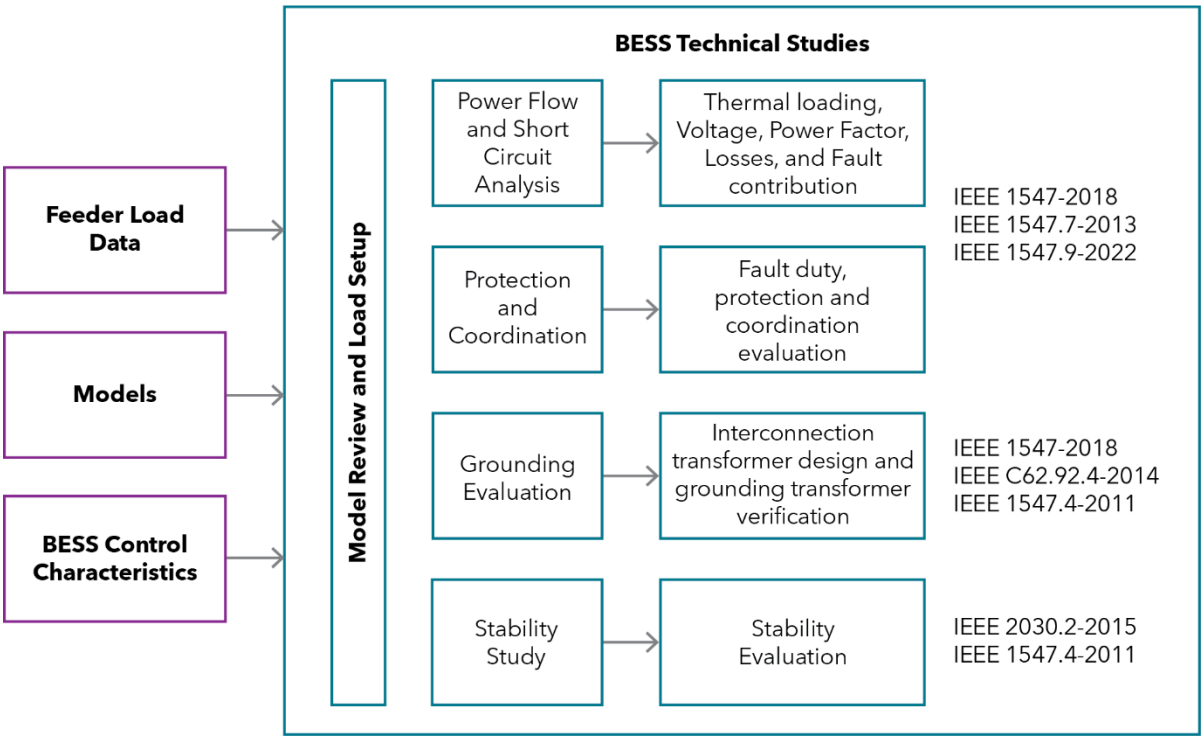
Operational Analysis Review Meeting (Meeting #2)

Leidos will facilitate a one-hour virtual meeting with the project team and the City staff to review the operational analysis findings and considerations that need to be addressed prior to performing the technical studies.

BESS Technical Studies

Leidos will conduct modeling and simulation studies to validate the technical feasibility and reliability impact of a BESS to evaluate whether it will provide the target benefits to the City. The proposed size and characteristics of the BESS can be adjusted and refined as needed based on the findings from the analyses. **Figure 1-1** on the following page illustrates the overall process flow of the BESS technical studies.

Figure 1-1. Overall Process Flow of the BESS Technical Studies



Leidos will implement the technical studies through the following tasks.

Model Review and Development

Leidos will review the provided model for accuracy and completeness. Leidos will validate assumptions, modeled loads, and DER within the model to confirm that it meets the criteria established during the kick-off meeting and will update the model accordingly. Leidos will collaborate with the City to make sure the model is ready for load setup.

Load Setup and Model Validation

Leidos will develop the load scenarios within the model based on the scenarios established during the kick-off meeting. The load setup also includes integrating possible EV or large consumer loads into the model based on the forecasting information discussed during the kick-off.

Leidos will perform a preliminary load flow and short-circuit analysis to validate the loading within the model. This validation and preliminary assessment will be used to provide a baseline for comparison of the system performance with the proposed BESS.

After validating the model, Leidos will incorporate the proposed BESS into the model for the following interconnection scenarios:

Interconnection Scenarios:

1. Replace a 14 MW combustion gas turbine with a utility scale battery. This is an aging fossil fuel resource located at a municipal power plant. The generator is connected to the 13.8 kV bus and supports distribution load at the substation in times of high usage.
2. Install a distribution level utility battery at a substation nearing capacity of its substation level
3. Install a transmission level utility battery at a substation requiring additional transmission capacity

Model Review Meeting (Meeting #3)

Leidos will facilitate a one-hour virtual meeting with the project team and the City staff to review the model development, model validation with baseline results, and risks or challenges that need to be addressed prior to performing the technical studies.

Technical Studies

Power flow and Short-Circuit Analysis

Leidos will use the established model, load scenarios, and BESS interconnection scenarios to evaluate the City's distribution and transmission system's capacity, power factor, voltage flicker, reverse power flow, and voltage regulation in accordance with the Institute of Electrical and Electronics Engineers (IEEE) 1547-2018, IEEE 1547.7-2013, and IEEE 1547.9-2022. In accordance with IEEE 2030.9-2019, the power flow calculations will be conducted for maximum and minimum loading conditions, maximum and minimum generation, and other load scenarios established during the kick-off meeting.

System total short-circuit current with the project in-service will be calculated to evaluate adequacy of existing protective devices.

The simulations will evaluate the worst-case impacts to the City transmission and distribution system.

Protection Coordination Analysis

Leidos will perform an overcurrent protective device coordination study for the scenarios to validate selectivity with the BESS in-service.

Stability Analysis

BESS helps stability under extreme system conditions. The dynamic stability will be tested with the addition of the BESS to the transmission system or the distribution system. The positive and negative impact of the BESS will be presented.

The following BESS dispatch scenarios will be studied:

- Replace a 14 MW combustion gas turbine with a utility scale battery. The generator is connected to the 13.8 kV bus and supports distribution load.
- Install a distribution level utility battery at a substation nearing capacity of its substation level transformers as an effort to defer more extensive capital improvements.

- Install a transmission level utility battery at the substation requiring additional transmission capacity as an effort to defer more extensive capital improvements.

The following study scenarios will be performed for each dispatch scenario:

- Loss of the largest generation unit nearby
- Loss of a major transmission line/distribution feeder nearby
- Three phase to ground fault nearby

Therefore, in total nine study scenarios will be studied for stability.

Additional scenarios will be studied if deemed necessary for additional cost.

Report

Draft Report Development

Leidos will develop a draft report of the findings from the operational analysis and technical studies. The report will include the findings from the operational analysis and technical studies.

Draft Review Meeting (Meeting #4)

Leidos will facilitate a one-hour virtual meeting with the project team and the City staff to review the findings and recommendations from the operational analysis and technical studies. The review meeting will include the following discussion topics:

- Review the operational analysis findings
- Review the model builds
- Review steady-state and transient study analysis methodology and results
- Discuss additional requests and modifications to the model or analysis

Leidos will provide up to one additional revision of the model, analysis, and draft report based on the City's feedback from the review meeting.

Final Revisions and Review Meeting (Meeting #5)

Leidos will facilitate a one-hour virtual meeting with the project team and the City staff to review incorporated comments and changes from the draft review meeting and identify last-minute changes required to the deliverables. The final report will be sealed by an Engineer registered in the state of Missouri. A second confidential version of this report will be developed for public use to satisfy adherence to NERC compliance and any NDA that the City has with neighboring utilities, reliability coordinators, and other compliance entities.

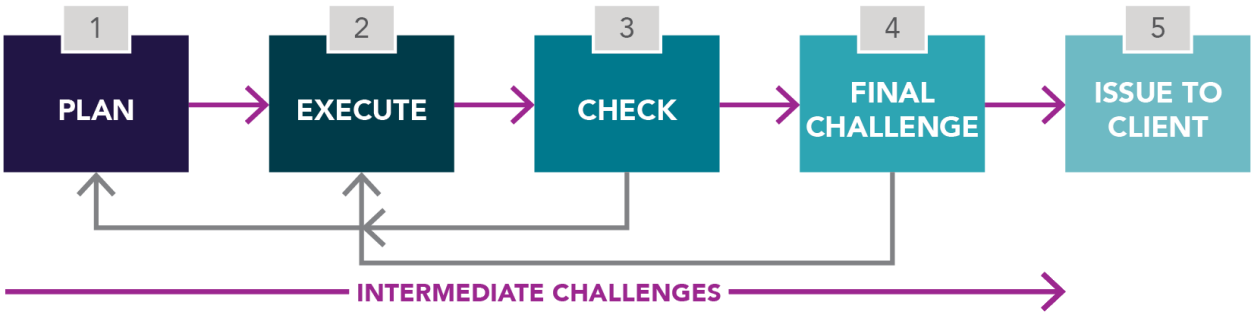
Quality Assurance Plan

Leidos is committed to providing high-quality engineering and design products and services that consistently meet or exceed client requirements. To accomplish this primary company mission, we maintain a standardized approach to project delivery and quality control. Our project team will follow this process and make changes that will be agreed upon during the kick-off meeting to meet the City's needs.

When you speak with Leidos' clients, they will confirm that Leidos is diligent about providing high-quality services. To maintain meticulous attention to quality in our work products, Leidos requires clearly established responsibility, accountability, and authority for well-defined quality assurance/quality control procedures for each project. Individual project quality control is backed by appropriate company-wide quality assurance requirements. Leidos' philosophy is to proactively instill project quality and prevent project problems rather than react to project problems that might result from poor quality assurance.

At the initiation of each project, the project manager reads and understands the contractual requirements to make sure the project's scope and associated approaches, standards, lessons learned, and client preferences are defined and that the project team is selected to meet the quality control requirements of the project. **Figure 1-2** illustrates the individual gates of our standard quality process, as well as the various intermediate challenges of our work products before final issuance to our clients.

Figure 1-2. Project Quality Lifecycle



Leidos' applies our quality process concurrently with the client's engineering quality process for work to be performed. In the context of this proposal, the **PLAN** stage will involve participants of the Project and will include the kick-off meeting and discussions involving the project scope, expectations, and assumptions. The **EXECUTE** stage will involve the performing engineer and will include the software recommendations, model build, analysis, reporting, and training material development. The **CHECK** stage will involve the technical leads who will check the work products, provide guidance on methodology, and make sure the product meets the client expectations. The **FINAL CHALLENGE** stage occurs at the end of the project prior to deliverables being handed to the City. The challenger is often a technical lead or project manager. Lastly, Leidos will issue the final deliverables to the City and repeat processes as needed to make sure the City is satisfied with its final product.

Quality assurance is performed to verify that work is performed in accordance with the established quality control requirements. Leidos conducts periodic independent reviews to verify that the established quality processes are being followed.

Deliverables

Leidos will prepare the final deliverables for the City. Final deliverables will include:

- Models with the BESS used for steady-state power flow and short-circuit, dynamic, and transient studies.
- Signed and stamped final report including:
  - Detailed operational analysis results including comparison of interconnection options and ownership options
  - Methodology, results, and recommendations from technical studies
  - Confidential version of the final report for public use.

Assumptions

- We assume Leidos and the City will agree on one BESS configuration and representative technology supplier for purposes of modeling tasks in the technical studies.
- To the extent the model and other data used to understand the electric system configuration are not up to date or do not contain the required data, the City and Leidos will develop an approach to make assumptions or obtain the data from the field using the City staff. If the agreed approach requires resources from Leidos, the City and Leidos will agree on the scope and cost of this additional task, and Leidos will perform it as Additional Services. Field data collection can be provided as Additional Services as well.
- It is assumed the model is mostly updated with the existing loads and equipment. Leidos has allocated hours for minor model modifications, but should extensive, model updates be required that exceed the estimated hours for Model Development, Leidos will provide those updates as Additional Services.
- The scope includes one two-hour and four one-hour virtual meetings.
- The scope includes one revision to the draft report defined herein.
- The technical studies are limited to normal configuration where the BESS is connected to the worst-case substation, worst case transmission feeder, or the municipal power plant.
- Transient models and settings for BESS inverters and applicable PV inverters are assumed to be provided. We will use generic inverter models and settings if the data is not available.
- The allocated hours include steady-state power flow and short-circuit analysis for up to 12 BESS interconnection use cases, loading scenarios, and system configurations and up to nine scenarios for stability analysis. Analysis of additional load scenarios or use cases may be performed as additional services.

Timeline

Table 1-1 shows the timeline associated with each of the above tasks not including the time associated with project holds due to the City's review of the information and data collection activities. To keep the project schedule close to the specified timeline shown below, it is assumed that the City will send data within two weeks of the requests. Iterative reviews of the data requests and additional issued data requests may cause a delay in the commencement of the project, but Leidos will attempt to provide the data request after the kick-off meeting to not delay the project schedule and will review the data requests in a timely manner to avoid work stoppages.

Table 1-1. Project Timeline

Task Name	Description	Timeline
Project Kick-Off (Meeting #1)	Kick-off Meeting and Data Collection	One week of contract authorization
Operational Analysis	Costs, Maintenance, Personnel, and Safety Analysis	Four weeks after kick-off
Meeting #2	Review of Operational Analysis	Within one week of completing Operational Analysis
Model Development	Review of model, load setup, and model validation	Two weeks after Operational Analysis
Meeting #3	Review model development	Within one week of completing Model Development
Technical Studies	Steady State and Transient Studies	Four weeks after Model Development
Meeting #4	Review Technical Studies	Within one week of completing Technical Studies
Draft Report	Progress updates on Stage-2 analysis and previously identified risks and challenges	Three weeks after Technical Studies
Meeting #5	Review draft report	Within one week of draft report development
Final Report	Final deliverables	Two weeks after Draft Report review meeting

Arrangements with Other Firms

Leidos does not plan on working with other firms for assistance on this project. Leidos will perform the work without subcontractors or joint ventures.

SECTION 5

Notice to Offerors

As a large diversified firm that frequently works with large government entities, Leidos is enrolled and participates in federal work authorization programs. Leidos will commit to providing a signed Work Authorization Form as provided in Exhibit E of the RFQ prior to contract award.

APPENDIX A

Additional Documentation

EXHIBIT F

MISCELLANEOUS INFORMATION

Employee/Conflict of Interest:

Offerors who are elected or appointed officials or employees of the City of Columbia or any political subdivision thereof, serving in an executive or administrative capacity, must comply with sections 105.450 to 105.458, RSMo, regarding conflict of interest. If the offeror or any owner of the offeror's organization is currently an elected or appointed official or an employee of the City of Columbia or any political subdivision thereof, please provide the following information:	
Name and title of elected or appointed official or employee of the City of Columbia or any political subdivision thereof:	N/A
If employee of the City of Columbia or political subdivision thereof, provide name of City or political subdivision where employed:	N/A
Percentage of ownership interest in offeror's organization held by elected or appointed official or employee of the City of Columbia or political subdivision thereof:	0 _____%

Registration of Business Name (if applicable) with the Missouri Secretary of State

The offeror should indicate the offeror's charter number and company name with the Missouri Secretary of State. Additionally, the offeror should provide proof of the offeror's good standing status with the Missouri Secretary of State. If the offeror is exempt from registering with the Missouri Secretary of State pursuant to section 351.572, RSMo., identify the specific section of 351.572 RSMo., which supports the exemption.

FL0639289 ***Charter Number (if applicable)***	Leidos Engineering, LLC ***Company Name***
If exempt from registering with the Missouri Secretary of State pursuant to section 351.572 RSMo., identify the section of 351.572 to support the exemption:	

city of Columbia
Finance

PURCHASING DIVISION

NOTICE TO OFFERORS

ADDENDUM #1 TO REQUEST FOR QUALIFICATIONS (RFQUAL) 137/2023: ENGINEERING SERVICES: BATTERY STUDY

Offerors shall note the changes stated herein to the above-mentioned RFQUAL and *incorporate these changes in their qualifications*. Offerors shall attach a signed acknowledged copy of this addendum to their qualifications, if submitting a hard copy (via paper) or agree to the addendum electronically if submitting through the electronic bid system on-line.

This addendum consists of the following information:

A) **The following questions (in black colored font) have been proposed by potential offerors. Answers (in red colored font) to questions have been provided by City of Columbia:**

Q1) Reference is made to providing an estimate of total time needed to complete the work; however, it does not mention cost being required as part of the qualifications. There is also reference to a fee schedule negotiation. Are we intended to provide a firm price cost for the proposal scope? If not, are we intended to provide fee schedule or rate sheets required as part of the qualification submittal?

A1) No type of cost is to be submitted in response to RFQUAL 137/2023. We evaluate on qualifications only and then we will request a fee schedule from the selected qualified offeror.

Q2) Does the City plan to provide the distribution utility power flow model for the 13.8kV interconnection evaluation?

A2) No

Q3) What software platform (e.g. CYME) is the distribution model is in?

A3) We do not intend to supply a distribution model.

Q4) Is a subcontractor allowed to upload the qualifications documentation on Ion Wave if the primary contractor listed in the proposal does not have a portal account?

A4) No. The prime contractor shall upload any relevant subcontractor information with their qualification's response. It should not be separate.

NO OTHER ADDITIONAL CHANGES MADE

CALE TURNER
PURCHASING AGENT

ACKNOWLEDGMENT

The undersigned offeror hereby certifies that the change set forth in this Addendum #1 have been incorporated in their qualifications and are a part of RFQUAL 137/2023. All other provisions of the RFQUAL document, except as stated herein, shall remain in force as written.

Firm Leidos Engineering, LLC Date 10/12/2023

Signed Alex Kim

Exhibit C

April 11, 2024

Cale Turner
Purchasing Agent
City of Columbia, Purchasing
701 East Broadway, 5th Floor
Columbia, MO 65201

Subject: **Re: RFQUAL 137/2023 – Request for Scope and Fees**

Dear Mr. Turner:

Leidos Engineering, LLC (Leidos) is pleased to submit additional information to the City of Columbia (the City) in response to the request for scope of services and fees prior to contract agreement for the Utility Scale Battery Study (the Study).

Detailed Scope

The City of Columbia (the City) desires utility-scale battery energy storage systems that can support the City's goal to increase renewable energy adaptation. The City needs to determine the technical feasibility, reliability impacts, costs, and operational aspects of a BESS on either their 69 kV or 13.8 kV substation levels in the City's substations.

The Project will consist of the following three stages:

- **Stage 1.** BESS Operational Study including cost analysis, maintenance procedures, safety concerns, and personnel considerations
- **Stage 2.** Technical Studies to confirm technical feasibility, impacts, and required T&D upgrades of BESS systems
- **Stage 3.** Report development

The project execution approach is described within the following sections.

Stage 1: BESS Operational Study

Leidos will provide an operational analysis, including estimated capital and operating costs, an overview of expected maintenance procedures, BESS safety considerations, and expected personnel requirements of a BESS for the following interconnection and ownership scenarios:

Interconnection Scenarios:

1. Replacing the City's aging 14 MW combustion gas turbine with a utility-scale BESS located at the City's municipal power plant. The analysis will evaluate a BESS connected to the 13.8 kV bus providing peak shaving services in support of the distribution load at the substation in times of high usage.
2. Installing a distribution-level utility BESS at a substation nearing capacity of its substation level to provide distribution-level peak shaving services and potentially defer capital costs associated with increasing the capacity of the substation.
3. Installing a transmission-level utility BESS at a substation requiring additional transmission capacity to provide transmission-level peak shaving services and potentially defer capital costs associated with increasing the capacity of the substation.

Ownership Scenarios:

1. Utility Owned
2. Third Party Owned

A comparison will be provided to assist the City in selecting the placement of and ownership of a BESS. The operation analysis will consist of the following tasks.

Task 1.1: Data Request and Kick-off Meeting (Meeting #1)

Data Request and Review

The City has indicated in the Scope of Services that they will provide the following input data for the study:

- Historical load data
- Load forecasting data
- Existing model developed by the City to perform simulations, such as PSSE or other suitable software
- Transmission and distribution contingencies
- Schematics of existing substations

Leidos will formally request additional data needed for modeling and analysis from the City to begin work and to proceed with developing an operational model of the City electric transmission system. Leidos will prepare a secure FTP site for transfer of project data to limit large file transfers via hard electronic media or large e-mail file transfers.

The data request will include, but is not limited to:

- Known areas with voltage or loading concerns on the study system
- Strategies and assumptions to deal with missing, inaccurate, or conflicting data
- Locations and available power output ratings (kW) of known existing or forecasted areas likely to adopt utility-scale distributed energy resources
- Results of recent field investigations concerning voltage and power factor of the system
- Historical supervisory control and data acquisition (SCADA) data for the substation power transformers and feeder breakers including kW and, where available, kvar loads, amps, voltage
- Information on potential project sites including dimensions of space available for equipment installation

Once data has been received, Leidos will review the data provided to identify the data gaps and, if required, request additional data needed to update the electric system model. Leidos will identify model development gaps from information contained within the data. This process will be iterative, but Leidos will provide the information requests with sufficient advance notice to prevent delays in project execution.

Kick-off Meeting (Meeting #1)

Leidos will facilitate a two-hour virtual meeting with the project team and the City staff to discuss the following topics related to the Project:

- Project Management
  - Project schedule
  - Leidos and the City staff responsibilities and project tasks
  - Data requests
- Study Scope and Goals
  - Model extents, assumptions, and needed updates
  - Discussion of anticipated load growth in terms of EV and other spot loads
  - Existing and forecasted DER
  - BESS modeling, application, and use cases
  - Loading scenarios to be considered in the analyses
  - Analyses to be conducted
  - Establish system operating requirements for evaluating capacity and voltage levels
  - Reporting content and format
  - The City's requirements to participate in the MISO market

Task 1.2: Load Management

For load management, Leidos will evaluate the information provided to assess the maximum real power required for discharge to maintain loading below a desired threshold as defined by the City. In addition, Leidos will assess the maximum energy required during a single, continuous discharge to maintain loading at the threshold. These two metrics (real power and discharge energy) will be used as inputs in

the BESS target ratings and specifications task. To further assess ongoing BESS performance, Leidos will work with the City to identify an expected number of discharge-cycles the BESS may perform on an annual basis in providing feeder load management.

Task 1.3: BESS Target Ratings and Specifications

BESS Inverter Ratings

Using the load management requirements defined in Task 1.2, Leidos will summarize the target specifications and performance requirements for the BESS inverter technology. Leidos will also evaluate voltage and/or power factor data to analyze potential reactive power required to provide voltage or power factor support to the given potential BESS location based on input or requirements provided by the City. Leidos will summarize the reactive power requirements determined in this analysis and the real power requirements from the load management analysis to determine a target total apparent power requirement for the BESS inverter.

BESS Usable AC Energy Ratings

The load management analysis will also inform the total usable AC energy requirements of the BESS. Leidos will incorporate pertinent energy losses associated with the given interconnection voltage scenario to ensure the target usable AC energy rating is sufficient to deliver the required power and duration determined in the load management analysis.

Operating Performance and Capabilities

In addition to reactive power, real power, apparent power, and total usable AC energy target ratings, Leidos will summarize the expected duty cycle associated with the desired use cases to evaluate an expected maximum number of discharge cycles per year the BESS would need to provide in operation. This metric informs the potential energy degradation of the BESS for future operation. Leidos will use this potential energy degradation to evaluate options for oversizing or augmenting the beginning of life usable AC energy of the BESS to maintain the desired rated duration, if desired by the City.

Task 1.4: BESS Technology Review and Vendor Survey

Upon confirming the target BESS specifications, ratings, and performance with the City, Leidos will evaluate multiple Original Equipment Manufacturer (OEM) suppliers for BESS to assess the supplier technology's ability to meet the requirements. This analysis will be performed using a combination of existing technology data Leidos has available for review and reaching out directly to suppliers to discuss the specific requirements. The OEM product review also includes verification of BESS ability to perform capacity enhancements to defer capital projects.

Based on this research, Leidos will develop a short list of potential suppliers and technology options available in the market today that could deliver the Project requirements and confirm achievable/available technology from OEM perspective. Leidos will provide a high-level comparison of each short-listed option for review by the City and the Project team. A high-level design of BESS will be developed to include functional and non-functional requirements, which the City could use for issuing procurement RFP in the future. The BESS design will evaluate BESS installation size requirements at the desired location.

Task 1.5: Maintenance Procedures

Leidos will provide a high-level summary of the maintenance procedures for operating a BESS, including typical preventative maintenance procedures for the BESS equipment.

Task 1.6: Safety Considerations

Leidos will provide a summary of the safety considerations for BESS installations based on industry best practices to support the City in informing involved personnel and residents. This will include a summary of typical fire safety and explosion prevention features, tests, and standards typically included in reputable BESS supplier technology. In addition, Leidos will provide recommendations regarding other additional safety protocols to be developed for BESS operation.

Task 1.7: Personnel Requirements

Leidos will provide recommendations for personnel positions and training for specialized service to utility-scale BESS. Training recommendations will be focused on ensuring personnel have an in-depth understanding of the BESS equipment functionality, topology, and operation, but will not be BESS supplier specific.

Task 1.8: Cost Evaluation

Leidos will evaluate the estimated capital and operational expenses to the City for procurement, installation, and operation of the BESS for each interconnection scenario. Leidos will compare the total cost of ownership of the BESS installation to the alternative associated with not installing the BESS to evaluate the net benefit.

Task 1.9: Stage 1 Review Meeting (Meeting #2)

Leidos will facilitate a one-hour virtual meeting with the project team and the City staff to review the operational analysis findings and considerations that need to be addressed prior to performing the technical studies.

Stage 2: BESS Technical Studies

Leidos will conduct technical studies to validate the technical feasibility and reliability impact of a BESS to evaluate whether it will provide the target benefits to the City. The proposed size and characteristics of the BESS can be adjusted and refined as needed based on the findings from the analyses. **Figure 1** illustrates the overall process flow of the BESS technical studies.

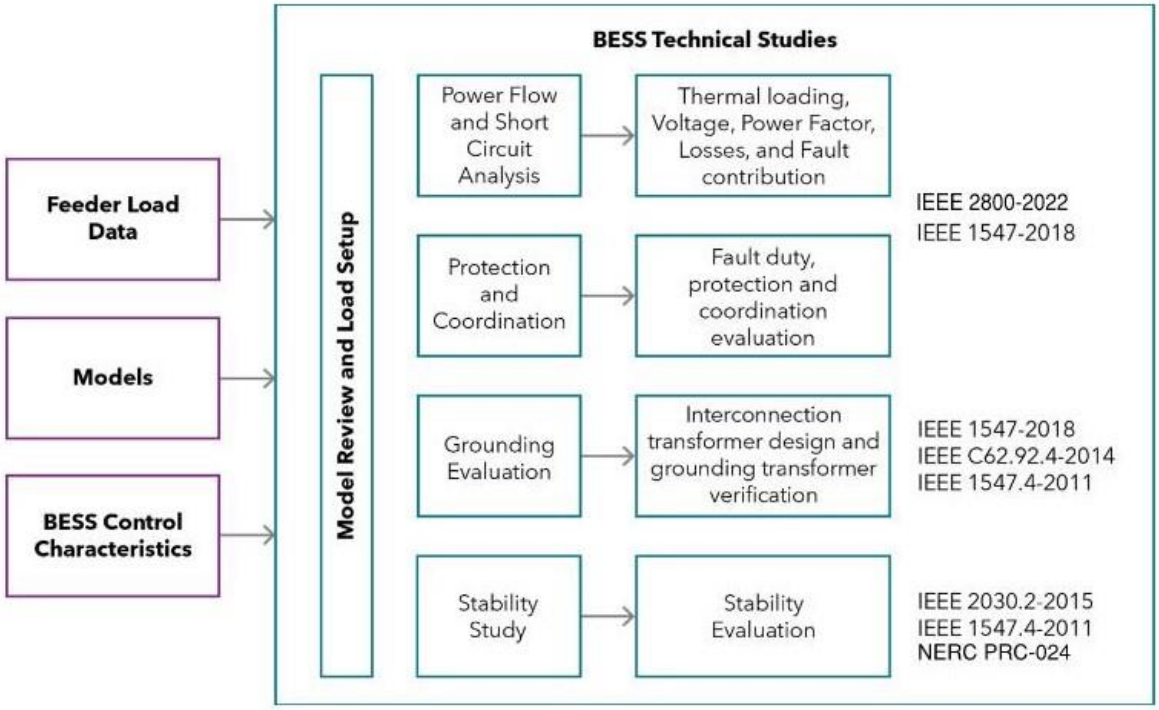


Figure 1. Overall Process Flow of the BESS Technical Studies

Leidos will implement the technical studies through the following tasks.

Task 2.1: Model Review and Development

Leidos will review the provided PSSE model for accuracy and completeness. Leidos will validate assumptions, modeled loads, and DER within the model to confirm that it meets the criteria established during the kick-off meeting and will update the model accordingly. Leidos will collaborate with the City to make sure the model is ready for load setup.

Leidos will develop the load scenarios within the model based on the scenarios established during the kick-off meeting. The load setup also includes integrating possible EV or large consumer loads into the model based on the forecasting information discussed during the kick-off.

After validating the model, Leidos will incorporate the proposed BESS into the model for the following interconnection scenarios.

Interconnection Scenarios:

1. Replace a 14 MW combustion gas turbine with a utility-scale battery. This is an aging fossil fuel resource located at a municipal power plant. The generator is connected to the 13.8 kV bus and supports distribution load at the substation in times of high usage.

2. Install a distribution-level utility battery at a substation nearing capacity of its substation level.
3. Install a transmission-level utility battery at a substation requiring additional transmission capacity.

Leidos will perform a preliminary load flow in PSSE to validate the loading within the model. This validation and preliminary assessment will be used to provide a baseline for comparison of the system performance with the proposed BESS.

Task 2.2: Model Review Meeting (Meeting #3)

Leidos will facilitate a one-hour virtual meeting with the project team and the City staff to review the model development, model validation with baseline results, and risks or challenges that need to be addressed prior to performing the technical studies.

Task 2.3: Steady State Power Flow and Short-Circuit Analysis

Leidos will use the established PSSE model, load scenarios, contingencies ((n-1) and (n-1-1)), and BESS interconnection scenarios to evaluate the City's distribution and transmission system's capacity, power factor, voltage flicker, reverse power flow, and voltage regulation in accordance with the Institute of Electrical and Electronics Engineers (IEEE) 1547-2018 and IEEE 2800-2022. The power flow calculations will be conducted for maximum and minimum loading conditions, maximum and minimum generation, and other load scenarios established during the kick-off meeting.

System total short-circuit current with the project in service under each interconnection scenario will be calculated in PSSE to evaluate adequacy of existing protective devices.

The simulations will evaluate the worst-case impacts to the City transmission and distribution system.

Task 2.4: Protection Coordination Analysis

Leidos will perform a high-level overcurrent protective device evaluation to ensure increased fault current levels due to the BESS do not impact existing device ratings. If fault current levels with the BESS exceed 10% of the existing fault current levels, Leidos will recommend a detailed coordination study be conducted. Leidos can provide the detailed coordination study for additional cost.

Task 2.5: Grounding Analysis

Leidos will evaluate the effective grounding of the proposed BESS installation.

Task 2.6: Stability Analysis

Leidos will perform a stability analysis in accordance with IEEE 2030.2-2015 and NERC PRC-024 standards. The positive and negative stability impacts of the BESS will be presented. The stability analysis will be limited within two buses from the proposed point of interconnection. The analysis will be limited up to 8 fault caused outage cases for each BESS installation scenario, up to 24 cases in total for all three BESS installation scenarios.

Task 2.7: Stage 2 Review Meeting (Meeting #4)

Leidos will facilitate a one-hour virtual meeting with the project team and the City staff to review the findings and recommendations from the operational analysis and technical studies. The review meeting will include the following discussion topics:

- Review the technical analysis findings
- Review the model builds
- Review steady-state and dynamic stability study analysis methodology and results
- Discuss additional requests and modifications to the model or analysis

Leidos will provide up to one additional revision of the models and analysis based on the City's feedback from the review meeting.

Stage 3: Report

Task 3.1: Draft Report Development

Leidos will develop a draft report of the findings from the operational analysis and technical studies. The report will include the findings from the operational analysis and technical studies.

Task 3.2: Final Revisions and Review Meeting (Meeting #5)

Leidos will facilitate a one-hour virtual meeting with the project team and the City staff to review incorporated comments and changes from the draft review and identify last-minute changes required to the deliverables. Leidos will provide up to one additional revision of the draft report based on the City's feedback. Additional revisions may be provided if deemed necessary for additional cost.

Task 3.3: Final Report

The final report will be sealed by an Engineer registered in the state of Missouri. A second version of this report will be developed for public use to satisfy adherence to NERC compliance and any NDA that the City has with neighboring utilities, reliability coordinators, and other compliance entities.

Deliverables

Leidos will prepare the final deliverables for the City. Final deliverables will include:

- Engineering models with the BESS used for steady-state power flow and short-circuit, dynamic studies.
- Signed and stamped final report including:
  - Detailed operational analysis results including comparison of interconnection options and ownership options
  - Methodology, results, and recommendations from technical studies
  - Final report for public use

Assumptions

- We assume Leidos and the City will agree on one BESS configuration and representative technology supplier for purposes of modeling tasks in the technical studies.
- To the extent the model and other data used to understand the electric system configuration are not up to date or do not contain the required data, the City and Leidos will develop an approach to make assumptions or obtain the data from the City staff. If the agreed approach requires resources from Leidos, the City and Leidos will agree on the scope and cost of this additional task, and Leidos will perform it as Additional Services.
- It is assumed the model is mostly updated with the existing loads, equipment, existing and approved generation. Leidos has allocated hours for minor model modifications, but should extensive model updates be required that exceed the estimated hours for Model Development, Leidos will provide those updates as Additional Services.
- The scope includes one two-hour and four one-hour virtual meetings.
- The scope includes one revision to the draft report defined herein.
- The technical studies are limited to normal configuration where the BESS is connected to the study substation, the study transmission feeder, or the municipal power plant.
- Dynamic models and settings for BESS inverters and applicable Solar PV inverters are assumed to be provided. We will use generic inverter models and settings if the data is not available.
- Work will commence upon execution of mutually acceptable terms and conditions.
- The allocated hours include steady-state power flow and short-circuit analysis for up to 8 BESS interconnection use cases, loading scenarios, contingencies, and system configurations and up to 24 fault caused outage scenarios for stability analysis (3 interconnection scenarios x 8 faults per each interconnection scenario). Analysis of additional fault scenarios can be performed as Additional Services.

Timeline

Table 1-1 shows the timeline associated with each of the above tasks not including the time associated with project holds due to the City's review of the information and data collection activities. To keep the project schedule close to the specified timeline shown below, it is assumed that the City will send data within two weeks of the requests. Iterative reviews of the data requests and additional issued data requests may cause a delay in the commencement of the project, but Leidos will attempt to provide the data request after the kick-off meeting to not delay the project schedule and will review the data requests in a timely manner to avoid work stoppages.

Table 1. Project Timeline

Task Number	Description	Duration (Weeks)																					
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Stage 1: BESS Operational Study																							
1.1	Kick-off Meeting (Meeting #1)/Data Request																						
1.2	Load Management																						
1.3	BESS Target Ratings and Specifications																						
1.4	BESS Technology Review and Vendor Survey																						
1.5	Maintenance Procedures																						
1.6	Safety Considerations																						
1.7	Personnel Requirements																						
1.8	Cost Evaluation																						
1.9	Stage 1 Review Meeting (Meeting #2)																						
Stage 2: Technical Studies																							
1.2	Model Review and Development																						
2.2	Model Review Meeting (Meeting #3)																						
2.3	Steady State Power Flow and Short-Circuit																						
2.4	Protection Coordination Analysis																						
2.5	Grounding Analysis																						
2.6	Stability Analysis																						
2.7	Stage 2 Review Meeting (Meeting #4)																						
Stage 3: Report																							
3.1	Draft Report Development																						
3.2	Final Revisions and Review Meeting (Meeting #5)																						
3.3	Final Report																						

Detailed Fees

The time and materials fee for the services under this Task Authorization will not exceed a maximum of Nineteen Nine Thousand Nine Hundred Fifty-Seven Dollars ($99,957) on the basis of the Scope of Services outlined above and the anticipated level of effort, without obtaining the prior written authorization of the Client. The Parties acknowledge that the authorization ceiling (not-to-exceed) is not meant to constitute a fixed fee or a limitation under which the Consultant provides services that are not included in the agreed upon Scope of Services. Notwithstanding anything to the contrary herein, the Consultant will not be required to furnish services or incur expenses for work not included in the Scope of Services without written authorization (including email) from the Client committing to additional funding.

Table 2 presents the fully loaded hourly rates for each individual job classification proposed for the work.

Table 2. Hourly Rates

Job Classification	Hourly Rate ($)
Technical Editor	100
Staff Engineer	125
Senior Engineer	175
Principal Project Manager	185
Principal Engineer	235
Principal BESS SME	325

The estimated cost for the proposed work is $99, 957. Table 3 presents the detailed budget as requested by the City.

Table 3. Detailed Budget

Task #	Task Description	Staff Engineer		Senior Engineer		Principal Engineer		Principal BESS SME		Principal Project Manager		Technical Editor		Total
		Hrs	Rate	Hrs	Rate	Hrs	Rate	Hrs	Rate	Hrs	Rate	Hrs	Rate	
1.0	Stage 1 - BESS Operational Analysis													
1.1	Kick-off Meeting#1 and Data Collection	4	125	19	175	6	235	4	325	2	185	2	100	**$7,212**
1.2	Load Management	-	125	2	175	23	235	4	325	2	185	-	100	**$7,550**
1.3	BESS Target Ratings and Specifications	-	125	-	175	15	235	4	325	2	185	-	100	**$5,208**
1.4	BESS Technology Review and Vendor Survey	-	125	-	175	15	235	4	325	2	185	-	100	**$5,208**
1.5	Maintenance Procedures	-	125	-	175	2	235	4	325	2	185	-	100	**$2,247**
1.6	Safety Considerations	-	125	-	175	2	235	2	325	2	185	-	100	**$1,532**
1.7	Personnel Requirements	-	125	-	175	2	235	2	325	2	185	-	100	**$1,532**
1.8	Cost Evaluation	-	125	2	175	4	235	4	325	2	185	-	100	**$3,043**
1.9	Stage-1 Review Meeting #2	2	125	4	175	2	235	4	325	2	185	-	100	**$3,245**
2.0	Stage 2 - Technical Studies													
2.1	Model Review and Development	34	125	36	175	2	235	-	325	1	185	-	100	**$11,135**
2.2	Model Review Meeting #3	1	125	6	175	2	235	2	325	1	185	-	100	**$2,604**
2.3	Power Flow and Short Circuit Analysis	25	125	38	175	2	235	-	325	1	185	-	100	**$10,453**
2.4	Protection Coordination Analysis	8	125	6	175	2	235	-	325	1	185	-	100	**$2,840**
2.5	Grounding Analysis	8	125	6	175	2	235	-	325	1	185	-	100	**$2,840**
2.6	Stability Analysis	24	125	40	175	2	235	-	325	1	185	-	100	**$10,688**
2.7	Stage-2 Review Meeting #4	1	125	6	175	2	235	2	325	1	185	-	100	**$2,604**
3.0	Stage 3 - Report													
3.1	Draft Report	24	125	20	175	18	235	6	325	1	185	8	100	**$13,674**
3.2	Final Review Meeting #5	1	125	4	175	2	235	2	325	1	185	-	100	**$2,237**
3.3	Final Report	6	125	4	175	4	235	2	325	1	185	8	100	**$4,107**
Total Labor		139		194		110		47		29		19		**$99,957**

The Leidos project team is excited to work with the City this year. On behalf of the firm and project team, we look forward to discussing our proposal and welcome the opportunity to provide additional support to the City.

Sincerely,

Leidos Engineering, LLC

Alex Kim
Contracts Manager

Sridhar Chouhan
Project Manager