



**N A R U C**  
National Association of Regulatory Utility Commissioners

## **Request for Proposals**

### **Assessing Potential Risks to the Distribution System from Older Inverter-based Distribution Generation**

**Solicitation Number: NARUC-2022-RFP130-DCH163**

Released: November 10, 2022

Expressions of Interest Due: November 22, 2022

~~Responses Due: November 29, 2022~~

**Revised Due Date: December 5, 2022**

Center for Partnerships & Innovation  
National Association of Regulatory Utility Commissioners  
1101 Vermont Avenue NW, Suite 200  
Washington, D.C. 20005

Note on applicants' eligibility: All applicants must meet the U.S. Department of Commerce National Institute of Standards and Technology Standard Terms Conditions (Annex I).

## I. Introduction and Background Information

With funding support from the National Institute for Standards and Technology (NIST) award number 70NANB21H163, the National Association of Regulatory Utility Commissioners (NARUC) seeks to engage a Consultant to research and develop information on the behavior of inverter-based distributed generation connected to the distribution system. Of particular interest is assessing the extent to which existing resources installed before the implementation of IEEE 1547-2018<sup>1</sup> represent a risk to power quality or grid stability, whether a result of an extensive installed base or a result of potentially negative interactions with newer “smart” inverters. The Consultant should also describe the extent to which adopting industry standards, adjusting inverter settings, requiring inverter retrofits, or other strategies to improve interoperability can mitigate adverse effects. The resulting report and analysis will be publicly accessible to all energy stakeholders such as federal regulators, utilities, environmental advocates, state legislators, state energy officials, and others.

## II. Objective

The Consultant will conduct a meta-analysis and prepare a report that assesses the potential for and potential magnitude of grid stability problems in states where existing installations of inverter-based distributed generation (DG) resources have begun to have a measurable effect on the operation of individual distribution circuits, and where thousands more DG resources certified under IEEE 1547-2018 are expected in the coming years or decades.

## III. Approach, Statement of Work, Timeline, and Deliverables

NARUC is seeking to engage a Consultant (organization or independent consultant) for various expert services and tasks as described below. NARUC envisions that this contract will extend from December 15, 2022 to July 31, 2023. All specified deliverables are to be completed and submitted by the Consultant prior to the end of the period of performance. Interim deliverable dates are approximate and subject to change by mutual agreement between NARUC and the Consultant.

Task	Task Description	Deliverable and deadline
<b>Task 1: Data Collection</b>	A. <b>Literature Review</b> Conduct a literature review to identify existing scholarship on the behavior of inverters during system faults and abnormal conditions. This should include a) inverters that were installed before (or are not compliant with) IEEE 1547-2018, b) inverters that are compliant with IEEE 1547-2018, and c) the potential for negative interaction between these two types. Unpublished findings (e.g., research conducted	A. List of sources and publications: February 15, 2023  B. List of available data, including summary info on

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<sup>1</sup> Institute of Electrical and Electronics Engineers 1547-2018 Standard for Interconnection and Interoperability of Distributed Energy Resources with Associated Electric Power Systems Interfaces (IEEE Std 1547-2018) published April 2018. [IEEE 1547-2018 Standard Guidance](#) | [Grid Modernization](#) | [NREL](#)

	<p>by utilities) should be included to the extent feasible.</p> <p><b>B. Research system characteristics</b> - Gather information on the distribution and characteristics of inverter-based resources connected to the distribution system in areas with historically high penetration of inverter-based DG (e.g, residential solar PV) with a focus on the extent to which the inverters were certified or comply with IEEE 1547 requirements, both 2003 versions and subsequent amendments addressing behavior under abnormal conditions. Understand the settings and operational parameters of installed inverters, both pre- and post-IEEE 1547-2018, as relates to the evolution of industry standards.</p>	<p>inverter type, quantity, vintage, and source: April 1, 2023</p>
<b>Task 2: Meta-analysis</b>	<p>Conduct a meta-analysis of the collected information to assess the potential for and magnitude of grid stability problems under increasing penetration of inverter-based DG certified under IEEE 1547-2018, including the extent to which new capabilities (interoperability) enabled by the standard may contribute to or ameliorate challenges. The analysis should also include any relevant recommendations for adopting industry standards, adjusting inverter settings, requiring inverter retrofits, or other strategies to improve interoperability can mitigate adverse effects.</p>	<p>Report with results and conclusions: May 1, 2023 (draft); June 1, 2023 (final).</p>
<b>Task 3: Reporting and Dissemination</b>	<p>Prepare summary materials, including a presentation and briefing, for TA recipients and NARUC members,</p>	<p>By July 15, 2023.</p>

The Consultant will coordinate closely and work at the direction of the NARUC Center for Partnerships & Innovation Staff on all task activities.

**Other Reporting Requirements**

NARUC expects the Consultant to submit monthly invoices summarizing activities undertaken during the month. The Consultant’s monthly invoice and progress reports will be in accordance with the template in Annex II.

**IV. Period of Performance**

This project is estimated to last from December 15, 2022 to July 31, 2023.

**V. Project Budget**

The budget should reflect a Time & Materials consulting agreement with a Not-to-Exceed ceiling price. This is a competitively bid project supported by federal funding through a non-profit

organization; costs should be feasible and prudent. The Consultant must submit cost proposals by task for the entire Statement of Work, following the budget template included in Annex III of the RFP.

**Compensation:** NARUC shall reimburse the Consultant for time and other direct costs, not to exceed the ceiling price in accordance with the Budget Proposal (Annex III) for work outlined in statement of work, Section III of the RFP. Any travel must be pre-approved by NARUC and costs will be reimbursed via reimbursement authorization for travel (RAFT) form in accordance with Federal Travel Regulations and guidelines. **No travel is expected during this agreement.**

NARUC shall directly pay and/or reimburse Consultant costs (non-travel) as described below:

- 1. RFP Budget item: Consultant Labor**
- 2. RFP Budget item: Reimbursable Other Direct Costs**
- 3. RFP Budget item: Indirect Costs, *if applicable***

#### **Rejection of Proposals & Incurred Costs**

NARUC reserves the right to reject any or all submitted proposals not in conformance with this RFP, or for other causes. NARUC shall not be liable for any costs incurred by any Consultant prior to the execution of a contract.

#### **VI. Grant Requirements**

The work for this Request for Proposals (RFP) will be undertaken as part of the Cooperative Agreement No. All applicants must meet the U.S. Department of Commerce, National Institute of Standards and Technology (NIST) Standard Terms and Conditions (Annex I). NIST reserves the right to alter any activities under this RFP, subject to availability of funds.

Respondents must be able to ensure compliance with monitoring procedures in accordance with the Office of Management and Budget (OMB) Circular A-133 and Applicable “Standard Provisions for Non-US Non-governmental Sub-grantees” and mandatory requirements included in Annex I.

#### **VII. Responding to the RFP**

All questions regarding the RFP should be directed to NARUC by email to [jloiter@naruc.org](mailto:jloiter@naruc.org). Please submit an initial expression of interest (EOI) by November 22, 2022 to Jeffrey Loiter, [jloiter@naruc.org](mailto:jloiter@naruc.org) to ensure receipt of any respondent questions and answers.

Submit responses to the RFP to [RFPs@naruc.org](mailto:RFPs@naruc.org) by e-mail. **RFP responses are due no later than 11:59 pm ET on ~~Tuesday, November 29, 2022~~ Monday, December 5, 2022.**

Please limit your description of relevant experience / capabilities and narrative addressing the proposed approach and treatment of the project tasks to no more than **six (6) pages**. Responses shall fully address the following within the page limit:

- Proposed approach and proposed treatment of the tasks and sub-tasks with a view toward expected deliverables
- Description of relevant experience and capabilities

Outside of the page limit, responses can also include:

- Cover letter
- One-page resume(s) of staff expected to work on the project
- Proposed budget, using template provided in Annex III

### **VIII. Consultant Selection & Evaluation Criteria – Required Qualifications**

NARUC will select one or more Consultant(s) through a competitive selection process. A NARUC Evaluation Team will consider the following criteria in assessing all responses to this RFP:

#### **Technical Experience and Applicant Qualifications (35% of total score)**

1. Relevant experience in proposed topics and work in energy sector, particularly with state utility commissions.
2. Adequate level of technical knowledge to meet the demands of the project.
3. Quality of academic and professional experience in relevant field.

#### **Proposed Approach for Implementation (45% of total score)**

1. Proposal responds to the outlined topics in the RFP.
2. Ability to identify technical assistance needs and information gaps to help regulators move from their current status towards goals and results.
3. Existing resources / Consultant availability to meet needs of rapid deployment.
4. Overall quality and professionalism of the proposal (well written, structured and organized) and materials provided in the format requested.

#### **Budget (20% of total score)**

1. Given the scope, is the estimated cost of the proposal appropriate?
2. Does overall cost reflect an efficient value for the level of effort?
3. Is the level of effort for each task appropriate?

## **ANNEX I: Additional Flow Down Requirements Applicable to the Subaward**

### **SPECIFIC AWARD CONDITIONS DEPARTMENT OF COMMERCE – NATIONAL INSTITUTE OF SCIENCE AND TECHNOLOGY AWARD NO. 70NANB21H163**

#### **DEPARTMENT OF COMMERCE FINANCIAL ASSISTANCE STANDARD TERMS AND CONDITIONS:**

The Department of Commerce Financial Assistance Standard Terms and Conditions (ST&C) issued November 12, 2020, are incorporated by reference into this award. The Department's ST&C, as well as a link to 2 CFR Part 200, are accessible at:

<https://www.commerce.gov/oam/policy/financialassistance-policy>

#### **Supervision of the Recipient's Staff and Associates and Compliance with NIST Policies on Use of Federal Facilities and Equipment:**

Consistent with Department of Commerce Financial Assistance Standard Terms and Conditions, Section A.05, nothing in this award will be construed as authorizing the Recipient or its employees, agents, or assigns to act as an agent or assign of NIST, and the Recipient must exercise all diligence to ensure that no third party construes the Recipient as an actual, ostensible, or apparent agent of NIST. For purposes of this award, the use of the term "personnel" herein includes all third parties, such as contractors, subrecipients, students, fellows, or others participating under the direction of the Recipient's programs. The Recipient acknowledges that it is independent of NIST in the performance of the approved projects, and that the Recipient assumes full and sole responsibility for all benefits and protections of the Recipient's personnel and agents whose services are utilized by the Recipient in the execution of this award.

Accordingly, the Recipient must control the means and manner of its personnel's activities on the project, including those conducted on a NIST campus, on Recipient property, and at other locations for the project. The Recipient must provide directly a salary, stipend, or other funding to the personnel, and must establish the work schedule and tenure for the personnel. The Recipient is the supervisor of record for the personnel, and will coordinate with NIST as needed to ensure that the research remains consistent with NIST program objectives. Any staff and affiliates of the Recipient participating in activities on a NIST site must sign and abide by the terms of the NIST Guest Researcher Agreement.

If this is a Cooperative Agreement, NIST will collaborate with the Recipient as described in Specific Award Condition titled "NIST Participation," and will coordinate with the Recipient as needed regarding progress on the research. NIST will have no firing or other terminating authority over the employment or affiliation status of the Recipient's personnel or affiliates. Any issues related to performance or conduct of Recipient personnel will be reported to the Recipient. Any suspension or termination action on this award will comply with 2 CFR §§ 200.339-.343 and the Department of Commerce Financial Assistance Standard Terms and Conditions, Sections A.06.

In addition, if any work for this project is performed at NIST facilities, the Recipient must comply with NIST policies regarding the use of Federal facilities and equipment.

#### **The Department of Commerce Research Terms and Conditions:**

The project funded under this award involves research, development, or related activities. The Department of Commerce (DOC) has therefore designated this award as "Research and Development" under 2 CFR § 200.1 for purposes of grants administration. The policies and requirements in 2 CFR Part 200 that apply to "research" awards apply to this award.

As indicated on the Form CD-450 for this award, the Federal-wide [Research Terms and Conditions](#) (RTCs), issued November 12, 2020, as adopted by the DOC effective as of November 12, 2020, are incorporated by reference into this award.

The RTCs are accessible at the [National Science Foundation RTC](#) website.

**NIST Publication Guidelines:**

The following NIST publication guidelines supplement the Department of Commerce Financial Assistance Standard Terms and Conditions, Section G.05.k.3., “Publications, Videos, and Acknowledgement of Sponsorship”:

(a) Recipients are encouraged to publish the research results of a NIST research grant/cooperative in open scientific literature in such a way as to be generally available to American Scientific Libraries;

(b) The Recipient should contact the Federal Program Officer for assistance in coordinating appropriate publication/dissemination of information resulting from a NIST research grant/cooperative agreement. For this purpose, the *NIST Technical Grant/Contractor Series (GCR)* or *The Journal of Research of NIST* may be used as publication venues, but the Recipient may choose other publication/dissemination methods;

(c) In any such publications, acknowledgement of NIST sponsorship must be made with a footnote or other appropriate notation reading, “This work was performed under the following financial assistance award **70NANB21H163** from U.S. Department of Commerce, National Institute of Standards and Technology,” or words to that effect;

(d) The Recipient must submit one (1) copy of any published work to the Federal Program Officer

**Public Access to Results of Federally Funded Research:**

All final peer-reviewed manuscripts arising from NIST-funded research must be (1) freely available within 12 months of publication in a journal associated with CHORUS (<https://www.chorusaccess.org/about/our-members/>), or (2) submitted to the NIST publications repository or equivalent within 12 months of publication. The Recipient should continue to report the status of any publications in their technical reports.

Further, if the Recipient included a Data Management Plan (DMP) as part of their application, the Recipient must comply with the terms of the DMP. All DMPs must comply with the requirements of [NIST Policy 5700.00](#), Managing Public Access to Results of Federally Funded Research, and [NIST Order 5701.00](#), Managing Public Access to Results of Federally Funded Research, or any successor Policy and Order.

**NIST Participation:**

The NIST will collaborate on the project as described in the scope of work.

In addition, consistent with Final Office of Management and Budget Guidance Implementing the Federal Grant and Cooperative Agreement Act, 43 Fed. Reg. 36860-65 (Aug. 18, 1978), NIST involvement in this cooperative agreement may also include the following:

1. Authority to halt immediately an activity if detailed performance specifications (e.g., construction specifications) are not met;
2. Requiring that the Recipient meet or adhere to specific procedural requirements before subsequent stages of a NIST-funded project may continue;
3. Approving substantive provisions of proposed subawards, participating in the selection of subawards, approving “Requests for Proposals” or “Invitations for Bids” to be issued by the Recipient or subrecipients, and approving a subrecipient before a subaward may be awarded;
4. Participating in selection of key personnel. The Recipient has final authority over its own personnel;
5. Collaborating with the Recipient by working jointly with a Recipient scientist or technician in carrying out the scope of work, training Recipient personnel, or detailing Federal personnel to work on the project effort;
6. Specifying direction or redirection of the scope of work due to inter-relationships with other projects such as requiring the Recipient to achieve a specific level of cooperation with other projects that may or may not be funded by NIST;
7. Substantial, direct NIST operational involvement during the project to ensure compliance with such statutory requirements as civil rights and environmental protection;
8. Limiting Recipient discretion with respect to scope of work, organizational structure, staffing, mode of operations and other management processes, coupled with close monitoring or operational involvement during performance.



## ANNEX II: Sample Monthly Invoice and Progress Report

To: NARUC/Attn: Jeffrey Loiter  
 From: *Consultant Name*  
 Project: *Subcontract Number to be assigned upon award*  
 Assessing Potential Risks to the Distribution System from Older Inverter-based  
 Distribution Generation

Invoice Date:  
 Billing Period Covered by Invoice:  
 Invoice Number:  
 Current Invoice Amount:  
 Cumulative Amount Billed to Date:

### A. Progress and Activities Completed

*Description of Work during the Period:*

*Deliverables Submitted:*

*Challenges Encountered or Anticipated:*

*Next Steps:*

### B. Budget Summary

	Current invoice	Cumulative invoiced to date	Total budgeted amount
<b>Task 1: Data Collection</b>			
Subtotal costs	\$	\$	\$
Estimated percentage of task completed to date	%	%	
<b>Task 2: Meta-analysis</b>			
Subtotal costs	\$	\$	\$
Estimated percentage of task completed to date	%	%	
<b>Task 3: Reporting and Dissemination</b>			
Subtotal costs	\$	\$	\$
Estimated percentage of task completed to date	%	%	
<b>Totals:</b>	\$	\$	\$

*Include an updated version of budget spreadsheet with each invoice by task, showing unit costs, hours, and total costs per labor category; direct costs; and indirect costs during the billing period.*

### **ANNEX III: Budget Template**

Please complete and submit the completed budget template as an Excel document (do not convert to PDF). Budget does not count towards page limit.

See file: \_\_\_\_\_