

Statement of Work

(TBD Appliance Manufacturer)

(TBD Date)

Round Robin Appliance Testing Program Test Study of Refrigerator/Freezer

(This SOW is utilizing the Refrigerator/Freezer type appliance as the test unit. This is for illustration of the template only and the actual appliance type would be named in the Agreement SOW)

1.0 SCOPE

1.1 Background

DOE's Appliances and Commercial Equipment Standards Program develops test procedures and minimum efficiency standards for residential appliances and commercial equipment. DOE is currently in the process of investigating the repeatability and reproducibility of residential appliance energy measurements at third party operated test facilities and manufacturer test facilities.

DOE has established a Round Robin Appliance Testing Program to gather information on the consistency of the testing procedures and applications. As such, DOE is engaging industry manufacturers, on a voluntary basis, to participate in the testing program. DOE has tasked URS, site support contractor to DOE/NETL, with the implementation of the program and the issuance of agreements with these manufacturers.

As a voluntary participant in this round robin test activity, the Consultant (Manufacturer) will conduct testing in accordance with the test procedure outlined in this SOW and provide data, results, and findings of the testing to URS. The information gathered will be provided to DOE for analysis, will be sanitized to remove any identification to the Laboratory who conducted a specific test, and then will be formulated into a public released document. The only costs to be reimbursed under this agreement are those associated with the shipping of the appliance unit(s) to the next identified location.

1.2 General Description of the Service

DOE shall purchase the appliances to be tested. DOE shall sanitize the appliance units by removing all identification indicating the manufacturer of the unit to be tested (thus making it a generic known unit). The appliance unit is Government property and will be issued to the testing facility as Government Furnished Property. The item will be identified by the Government Property Tag placed on the unit.

Once received, the Consultant shall conduct DOE round robin energy testing of the designated appliance unit in accordance with Section 3.0 below. The purpose of this test effort is to provide an assessment of the repeatability and reproducibility of appliance efficiency test results when tested in accordance with DOE's test procedures at third party operated test facilities and manufacturer test facilities. The Consultant shall conduct this testing work within 30 days after receipt of the appliance unit (unless a time extension is requested in writing and approved). The Consultant shall maintain high levels of quality control and careful documentation throughout the testing process.

When testing is complete, the Consultant shall package and ship the appliance unit to the next identified testing laboratory. To control shipping cost, the Consultant shall maintain and re-use package materials as identified in section 3.1 below.

2.0 REFERENCES

2.1 Definitions

- CFR – Code of Federal Regulations
- DOE – U.S. Department of Energy
- NCI – Navigant Consulting, Inc.
- QA/QC – Quality Assurance/Quality Control
- STR – Subcontract Technical Representative: An URS Energy and Construction, Inc. employee that is responsible for overseeing the safe, efficient, and effective execution of this statement of work. The designated STR for this assignment is:

Jay Davis, Appliance Testing Activity Manager
URS Energy and Construction, Inc.
3610 Collins Ferry Rd.
Morgantown, WV 26505
Office Telephone: (304) 285-4222
Jay.Davis@UR.NETL.DOE.GOV

- Technical Monitor: At the direction of the STR, a NCI employee that will provide technical oversight for performance of the statement of work, including providing technical guidance to the Consultant and reviewing deliverables. The Technical Monitors for this assignment is:

Mark Carlisle, Consultant
Navigant Consulting, Inc.
4 PPG Place, 4th Floor
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412-454-4123

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2.2 Codes, Standards, Orders, Regulations

Not used.

2.3 Applicable Documents

10 CFR 430 Subpart B Appendix A1: *Uniform Test Method for Measuring the Energy Consumption of Electric Refrigerators and Electric Refrigerator-Freezers*. Publication date 12/16/2010

2.4 Drawings

Not used.

3.0 WORK REQUIREMENTS

3.1 Task Requirements

Refrigerator/Freezer Testing

The Consultant shall test the selected refrigerator/freezer in strict accordance with the DOE test procedure indicated in Table 3.1 and the applicable documents noted in Section 2.3, including all tests necessary to measure and calculate the key metrics listed in Table 3.1. The selected refrigerator/freezer shall be tested in accordance with the DOE test procedure and guidance document for a total of three (3) tests.

Table 3.1: Test Quantities and Test Procedures

Appliance Type	Applicable DOE Test Procedure from 10 CFR Part 430 Subpart B	Key Performance Metrics	Test Quantity
Refrigerator-Freezer	Appendix A1, Uniform Test Method for Measuring the Energy Consumption of Electric Refrigerators and Electric Refrigerator-Freezers	Adjusted Total Volume (cubic feet) ^a	1
		Annual Energy Use (kWh/year)	3

^a This measurement will be conducted on a designated “volume measurement” unit, which differs from the first “energy tested” unit, and will be shipped separately to your test lab.

Additional Testing Requirements:

- Between each test, the test unit shall be moved away from the wall and unplugged for a period of at least 12 hours.

- Thermocouples are to be installed for the first test, and are not to be removed from the unit until completion of the final test.
- Measurements of the location of the thermocouples shall be conducted for each energy test conducted.

Project Furnished Materials, Equipment, or Services

DOE-NETL will supply the refrigerator/freezer unit for testing, which will be shipped to the Consultant at their **TBD** location. After completion of testing, the Consultant shall package and ship the unit to the address that will be provided. The Consultant shall provide all other materials required for testing.

The selected refrigerator/freezer will be provided in a custom enclosure designed to reduce the potential of shipping damage. The Consultant must not damage the custom enclosure during unpacking, must retain all packaging materials and repack the selected refrigerator/freezer for shipment to the next designated test location.

Confidentiality

The Consultant shall not consult with other parties having a business interest in the piece of equipment under test, unless specifically authorized by the STR and/or the Technical Monitor. If authorized, such contact shall be for the purposes of obtaining information needed for technical analysis of the piece of equipment.

The Consultant shall limit access to any unpublished documents or analytical spreadsheets to:

- Consultant employees specifically assigned to assist in the analysis of refrigerator/freezers, or perform necessary quality assurance/quality control (QA/QC) functions.
- The STR and/or Technical Monitor.

In addition, the Consultant shall keep confidential the nature of the work being performed and all analytical results.

All communications, correspondences, and test results related to round robin testing will de-identify the test facility and the unit under test. Each test facility will, instead, be identified by a lab code (e.g. "Lab C"), which is known only by that particular lab.

Impartiality

All testing and technical support must be provided by parties having no vested interest in the results of the tests. The Consultant shall certify its impartiality as to the results of the analysis.

Testing Location(s) and Use of Second-Tier Subcontractors

The Consultant shall conduct all testing at its test facilities in **TBD**. The Consultant shall not subcontract the testing or technical support, or otherwise assign third parties to conduct this work.

3.2 Quality Requirements

The Consultant shall conduct all testing in accordance with QA/QC management procedures designed to ensure the accuracy of the test results and completeness of all associated documentation. This includes, but is not limited to:

- Regularly calibrating instrumentation and maintaining calibration records.
- Methods/procedures to ensure that the relevant DOE test-procedure is followed rigorously.
- The Consultant's quality control system and test activities/records are subject to URS audit and/or surveillance verification actions at any time during fulfillment of this order.

3.3 Site Conditions

Not used.

3.4 Period of Performance/Schedule

The Consultant shall complete all work, including submittal of all deliverables, no later than five (5) weeks after receipt of test unit (unless a time extension is requested in writing and approved).

3.5 Personnel Qualifications/Certifications

In conducting this assignment, the Consultant shall use personnel who are trained in and are familiar with:

- Laboratory testing practices, instrumentation, data acquisition, data analysis, and reporting.
- The use of the relevant DOE test procedures, including all calculations and test conditions required.

3.6 Deliverables

- Final Test Report (due five (5) weeks after receipt of units): Each Test Report shall be completed per the report template to be supplied by the Technical Monitor. At a minimum, the report shall include:
 - Cover page with title, Consultant name, testing location, date, and other relevant information.
 - Condition of appliance tested as received.
 - Appliance photographs (see above).

For each of the three (3) tests:

- All test results.
- Supporting test measurements and analyses.
- Descriptions of test set up, including instrumentation (with pertinent calibration information), with photographs showing the exact placement of all sensors on, in, or around the appliance.
- Position of every user-operable control setting (whether specified in the DOE test procedure or not).
- Test Data: upon request, the Consultant shall deliver raw test data as recorded during testing. Data recorded electronically shall be delivered electronically in a format that can be read using standard Microsoft Office software.
- Return shipping of tested unit: upon completion of testing, as outlined below.

Additional Requirements:

- The Consultant shall be available for informal telephone and e-mail communications to discuss questions, work status, and issues as they arise.
- On-site visits and inspections as follows, which may include representatives from both URS, DOE, and/or NCI:
 - On-site inspection and approval of test set up and instrumentation prior to onset of testing.
 - Possible additional on-site meetings/inspections to review test-procedure-specific QA/QC procedures and practices.
 - On-site witnessing of round robin testing of the refrigerator/freezer.
- The Consultant may be required to store appliances for up to five (5) weeks after all testing is complete and all reports are delivered (appliance storage time may vary depending on when the next test lab is ready to receive delivery).

Any information associated with this assignment that is disclosed to third parties or the public will de-identify all participating test facilities. Each test facility will, instead, be identified by a lab code (e.g. "Lab C"), which is known only by that particular lab. The

manufacturer identity of the unit under test will be disclosed to neither the participating test facilities, third parties, nor the public.

3.7 Reimbursement

The Consultant shall invoice for shipping expenses based on actual shipping costs incurred, without additional mark up. No additional cost for packaging materials is authorized without the express written consent of the Client.

4.0 ACCEPTANCE OF SERVICES

4.1 Inspection/Testing Requirements

The STR and/or Technical Monitor reserve the right to witness portions of the testing and inspect testing facilities. The STR and/or Technical Monitor will provide advanced notice of any intent to witness testing or inspect testing facilities.

4.2 Final Acceptance Method

The STR will determine whether deliverables are acceptable. The Consultant shall revise and/or correct deliverables, as needed, to secure the STR's acceptance.

5.0 ATTACHMENTS

Not used.

(end of document)