Requirements / Specification Document

National Institute of Standards and Technology
U.S. Department of Commerce

TITLE: Power Sensor Check Standard

Requesting Laboratory / Division / Group:

Communications Technology Laboratory
Radio Frequency Technology Division
Guided Wave Electromagnetics Group (672.01)

General Statement of Need:

The Communications Technology Laboratory (CTL) at the National Institute of Standards and Technology (NIST) enables science and industry by providing essential measurement methods, instrumentation, and standards to support all phases of communications technology development, from fundamental characterization and discovery to production.

To support research and measurement services in radio frequency and microwave power, the Radio Frequency Technology Division in CTL requires a power sensor that can operate in multiple rectangular waveguide bands. The power sensor will serve as a check standard for power calibrations performed with both connectorized and on-wafer equipment. Only new equipment will be considered.

Item Specifications and Quantities:

Item 1:	**Calorimetric Power Meter**	
Quantity:	**1**	
Specifications:	1.1	Power measurements in rectangular waveguide bands spanning frequencies from at least 75 GHz to 1.1 THz.
	1.2	Typical relative power measurement accuracy of ±5 % across all supported rectangular waveguide bands.
	1.3	Measurement ranges from 1 µW to 200 mW.
	1.4	Maximum continuous wave (CW) input power of at least 200 mW.
	1.5	Calibration factor switch to adjust the power meter display to correct for input loss or gain.
	1.6	Internal calibration capability to heat the sensor element with a known amount of dc power.
	1.7	USB port for instrument control.
	1.8	Compensate temperature drift to less than 2 µW·°C^{-1}.
	1.9	Operational temperature range of at least 10 °C to 30 °C.

Item 2:	**Waveguide Taper from WR-10 to WR-6.5**	
Quantity:	**2**	
Specifications:	2.1	Operating frequency range of 110 GHz to 170 GHz
	2.2	Loss of approximately 0.16 dB
	2.3	Length of approximately 1 inch
Item 3:	**Waveguide Taper from WR-10 to WR-4.3**	
Quantity:	**2**	
Specifications:	3.1	Operating frequency range of 170 GHz to 260 GHz
	3.2	Loss of approximately 0.28 dB
	3.3	Length of approximately 1 inch
Item 4:	**Waveguide Taper from WR-10 to WR-3.4**	
Quantity:	**2**	
Specifications:	4.1	Operating frequency range of 220 GHz to 330 GHz
	4.2	Loss of approximately 0.32 dB
	4.3	Length of approximately 1 inch

Vendor Requirements

1. Possess at time of award/contracting an Export Control Classification Number (ECCN).

2. Possess at time of award/contracting a Unique Entity Identification Number (UEI) which registration is listed as “Active” on the GSA System for Award Management (SAM.gov).

Procurement Support Information and Ancillary Services:

Section		Requirements/Specifications
Planning Considerations ☒ **N/A**	☐	List any visits required to allow potential vendors to see site specific constraints. [Explain Requirements.]
	☐	US citizen required on-site (foreign nationals require pre-registration 30 days prior to visit.)
	☐	Vendor Representative On-Site more than three (3) days.
	☐	Other Considerations: [List other considerations to ensure an accurate quote.]

Shipping & Delivery ☐ N/A	Shipping Address: ☒ NIST-Boulder ATTN: TBA Mail Stop: TBA 325 Broadway Boulder, CO 80305 ☐ NIST-Gaithersburg ATTN: Mail Stop: 100 Bureau Dr Gaithersburg MD 20899 ☐ [Alternate Shipping Address] Shipping Criteria: ☐ **Partial Delivery Acceptable** ☐ [Enter Shipping and Delivery information by item.] ☐ Direct Delivery to OU Building Required [Explain Need for Requirement] Building /Room Number: [Enter Building/Room Number] ☐ Building has Loading Dock Containerization Preference: [Enter Container Type] Other Requirements: [List Any Other Requirement] Delivery Date Criteria: ☒ Delivery Shall Be Competed No Later Than: 12 weeks after contract award date ☐ Delivery Shall Be Made No Earlier Than: Click or tap to enter a date. ☐ Scheduled Deliveries: ☐ Other: [List Other Shipping, Delivery or Special Requirements.]
Electronic Media	[Enter Electronic Media Requirements by Item.]

Item Number	Due Date

☒ **N/A**	☐ Software ☐ Electronic Manuals ☐ License Key ☐ Other: [List Any Other Electronic Media Requirements] ☐ US Government Email Address for Software Delivery: [Enter Address]
Installation ☒ **N/A**	[Enter Installation Requirements by Item] ☐ Vendor Technician on Site ☐ Rigging ☐ Uncrating / Unpackaging ☐ Removal of Packaging Material ☐ Equipment Set Up ☐ Start-Up Services ☐ Turnkey Installation ☐ Other: [Enter Details] NOTE: TPOC shall be the coordination POC.
Facility / Utility Considerations ☒ **N/A**	[List Site Specific Utility Considerations by Item] ☐ OFPM Work Order Numbers [List Work Order Numbers] ☐ Power Available Voltage: [Enter voltage] (V) Maximum Current: [Enter max current draw] (A) Phase: [Choose Phase] Frequency: [Typically 60Hz] (Hz) NEMA Plug Type: [Enter Plug Type] (i.e.: NEMA L5-20P) Environment: [Choose Environment] Other Power Considerations: [List Any Other Power Considerations.] ☐ Utility Connections: [List Relevant Available Utilities, Pressure(s) and Flowrate(s).]

☐ Other Considerations:
[List Other Considerations to Ensure an Accurate Quote.]

Inspection and Acceptance
☐ N/A

[Inspection Requirements Per Item (Who, When, What, Where)]

☒ On-Site
☒ Acceptance Not Expected to Exceed 7 Business Days
☐ Acceptance Expected to Exceed 7 Business Days:
[Duration]
☐ Inspection and Acceptance Plan:
[Explanation]
☐ Other:
[Enter Other Requirements]

Training
☒ **N/A**

Training Requirements (Who, When, What, Where)

☐ Number of Trainees: [Enter Number of Trainees]
☐ On-Site
☐ Off-Site Location: [Enter Location(s)]
Is Trainee Travel Required: [Choose Answer]

Scope of Training
☐ Operation ☐ Maintenance ☐ Troubleshooting
☐ Safety ☐ Other
[Enter Other Scope of Training Requirements]

☐ Training Materials to be Provided by Government:
[Describe Materials]
☐ Training Materials to be Provided by Vendor:
[Describe Materials]
☐ Other
[Enter Other Training Requirements]

NOTE: SME shall be coordination POC.

Warranty
☐ N/A

Base Manufacturer Warranty is acceptable
Warranty Length: [i.e. 3 - Years]
What is included?

☐ Labor ☐ Parts ☐ Travel
☐ Cost and Liability for Returns
☐ Other
[Enter Other Requirements]
☐ 1 Option Period
☐ 2 Option Periods
☐ 3 Option Periods
☐ 4 Option Periods (Maximum)

Calibration
☒ **N/A**

[Describe Calibration Requirements Per Item]
Calibration Plan Length: [i.e. 3 - Years]
What is Included?
☐ Labor ☐ Spare Parts ☐ Consumables
☐ Travel ☐ Cost and Liability for Shipment
☐ Software Updates ☐ Manuals
☐ Other
[Enter Other Requirements]
☐ Requirements:
[Enter Requirements] (i.e.: On-Site Within 72 hours, etc.)
☐ 1 Option Period
Length: [i.e. 1 – Year / 6 - Months]
☐ 2 Option Periods
☐ 3 Option Periods
☐ 4 Option Periods (Maximum)

Maintenance
☒ **N/A**

[Describe Maintenance Requirements Per Item]
Maintenance Plan Length: [i.e. 3 - Years]
What is Included?
☐ Labor ☐ Spare Parts ☐ Consumables
☐ Travel ☐ Cost and Liability for Shipment
☐ Software Updates ☐ Manuals
☐ Other
[Enter Other Requirements]
☐ Requirements:

	[Enter Requirements] (i.e.: On-Site Within 72 hours, etc.) ☐ 1 Option Period Length: [i.e. 1 – Year / 6 - Months] ☐ 2 Option Periods ☐ 3 Option Periods ☐ 4 Option Periods (Maximum)
Government Furnished Material / Equipment ☒ **N/A**	List Any Government Furnished Material / Equipment Per Item] ☐ Samples for Testing ☐ Equipment which will leave Government Site Description: [Enter Description] Serial Number: [Enter Serial Number] NIST Property Number: [Enter NIST Property Number] ☐ Other: [Enter Other Details]
Travel ☒ **N/A**	[Describe any Travel Requirements Per Item] ☐ Explain: [Enter Justification / Requirement] ☐ Other: [Enter Other Requirements] NOTE TO VENDOR: To the maximum extent possible, include travel requirement estimates as part of pertinent sections above (Installation, Maintenance, Repair, etc.). Otherwise, Travel will be a separate line item, reimbursable per the Federal Travel Regulation.