

<b>AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT</b>			1. CONTRACT ID CODE	PAGE OF PAGES 1   5
2. AMENDMENT/MODIFICATION NO. 0004	3. EFFECTIVE DATE Jul 25, 2008	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. (If applicable)	
6. ISSUED BY NASA/Stennis Space Center Office of Procurement Program Management Support Division Building 1100 Room 251H Stennis Space Center, MS 39529-6000	CODE	7. ADMINISTERED BY (If other than Item 6) Same as block #6	CODE	
8. NAME AND ADDRESS OF CONTRACTOR (No. Street, county, State and ZIP: Code)			( <input checked="" type="checkbox"/> ) 9A. AMENDMENT OF SOLICITATION NO. NNS08239009R	( <input checked="" type="checkbox"/> ) 9B. DATED (SEE ITEM 11) Jun 11, 2008
CODE			10A. MODIFICATION OF CONTRACT/ORDER NO.	
FACILITY CODE			10B. DATED (SEE ITEM 13)	

**11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS**

The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers  is extended,  is not extended.

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:

(a) By completing Items 8 and 15, and returning one (1) copy of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATA SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and data specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)

N/A

**13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.**

<input checked="" type="checkbox"/>	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
<input type="checkbox"/>	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
<input type="checkbox"/>	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
<input type="checkbox"/>	D. OTHER Specify type of modification and authority)

E. IMPORTANT: Contractor  is not,  is required to sign this document and return 1 copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

**Solicitation No. NNS08239009R for High Speed Data Acquisition System Signal Conditioning Channels, is hereby amended as follows – see attached pages 2 through 5.**

**Note: This amendment includes technical questions and answers only. Amendment 0005 will include the technical specification changes as a result of these questions and answers and a new date for receipt of proposals.**

**All other terms and conditions remain unchanged.**

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER (Type or print)	16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) Michelle Stracener
15B. CONTRACTOR/OFFEROR	16B. UNITED STATES OF AMERICA
15C. DATE SIGNED	16C. DATE SIGNED 7-25-08
(Signature of person authorized to sign)	BY (Signature of Contracting Officer)

The following questions and answers are hereby incorporated into the subject solicitation.

Question: The SOW states that a 32 channel pilot system is required. What is the channel mix required (charge/IEPE vs. bridge vs. instrumentation amps)?

**ANSWER: These quantities were provided in previous responses to vendor questions. However, NASA is revising these quantities as follows:**

**Ten (10) bridge completion conditioners (strain gages)**

**Nine (9) IEPE conditioners**

**Nine (9) charge mode devices**

**Four (4) voltage only inputs.**

Question: 1.1 Reduce maintenance and troubleshooting costs

Do you have a cost model for maintenance and troubleshooting so that we can verify that we have achieved this objective?

Question: 1.2 Maintain or improve existing reliability

Do you have metrics on MTTF for MTBF on the current system so that we can verify that we have achieved this objective?

Question: 1.3 Reduce data acquisition process variability

How do you characterize data acquisition process variability? How can we measure that we have reduced the variability?

Question: 1.4 Maintain current data quality and system operational characteristics.

Please specify metrics for data quality and system operational characteristics for the current system that you require so that we can be sure to achieve this.

**ANSWERS to 1.1, 1.2, 1.3, 1.4: These goals are for NASA's internal use only. The vendor shall provide information describing the product's features and capabilities in proposal to assist NASA in obtaining these goals.**

Question: 4.1, 7.2 Please describe the requirements for shunt calibration. Is the 5-step calibration mentioned in 7.2 a shunt calibration? Is NASA furnishing the shunt cal resistors? If so, what is the physical size of the shunt calibration resistors?

**ANSWER: Our requirement is only for a single step shunt calibration. The shunt calibration is to be used with strain gage measurements which "shunt" in a resistor in parallel to one of the legs of the Wheatstone bridge. This resistor shall reside on the signal conditioning card and shall be able to be placed in parallel with the Wheatstone bridge via the programmable interface.**

**The 5 step calibration requirement shall be removed.**

**The size of shunt calibration resistors is small- A standard axial lead package approximately 1cm long by 3mm wide.**

Question: 4.1.1 What is the physical size of the completion resistors?

**ANSWER: See above**

Question: 4.1.2 What is the maximum current for the constant voltage excitation? Please elaborate on what you mean by “the excitation power supply shall not produce over voltage due to open circuit in the constant current mode of operation”. Do you want us to limit the compliance voltage of the constant current excitation supply? What compliance voltage do you require?

**ANSWER: 100 mA for the maximum current in constant voltage mode. Specification will change to 0 to 28 Volts from 0.1 to 15 volts. Limit open circuit constant current mode excitation to 10 volts. This will be added to the specification in the “Constant Current” column.**

Question: 4.1.3 What is the range of the balance that you require?

**ANSWER: Balancing is only required for strain gages. This is required to keep amplifier from over-scaling when going from ambient to cryogenic temp. NASA must have the capability to zero balance +/- 10 volt offset.**

Question: 4.1.4 What is the range of the calibration source that you require?

**ANSWER: Specification 4.1.4 states “with a range similar to the excitation power supply.”**

Question: 5.0 Which portion of the instrumentation amplifier specs applies to the charge amplifier?

**ANSWER: 4.2.1, 4.2.3, Sections 5.0, 6.0, 7.0 in their entirety.**

Question: 5.1.2 Gain accuracy in 5.8 is stated as 0.1% while in 5.1.2 it is stated as 0.05%. Please clarify.

**ANSWER: This response was previously provided in responses to vendor questions. Please refer to those responses.**

Question: 5.1.8 Paragraph 5.1.8 states that the CMV operating must be +/-50V while paragraph 5.4.1 indicates that the CMV protection must be +/-50V. Would a unit that provides the protection in 5.4.1 that operates at a CMV of +/-10V be acceptable?

**ANSWER: The specification in 5.1.8 states “Amplifier shall be capable of operating at a CMV to  $\pm 50V$ ”, while 5.4.1 states “Input voltage of  $\pm 50$  volts differential or common mode (continuous) shall not damage the units. Input voltage of  $\pm 200$  volts common mode (peak, transient, 10% duty cycle) shall not damage the units”. These are not contradictory requirements; these requirements are specifying two different aspects of input protection. Neither of these requirements is negotiable to lower values.**

Question: 5.5.1 Do the filtered and wideband outputs need independent gain control?

**ANSWER: No. Filter first, then apply gain. No requirement to gain before filtering.**

Question: 5.5.4 What additional outputs other than filtered and wideband are required?

**ANSWER: No additional outputs are required. However, keep in mind that all outputs must be able to fully utilize the entire functionality of the system, such as programmable gains, and monitoring capability at the programmable interface.**

Question: 6.0 Do you require that the programmable gain be distributed before and after the filter so that you can eliminate out-band signals with the filter prior to application of all channel gain or can all the gain be located ahead of the filter?

**ANSWER: While not required, this feature could be useful for the reasons described in the question. However, NASA cannot impose this as a requirement.**

Question: 8.1 & 10.0: Our understanding is that the amplifier and excitation supplies are isolated and thus have separate references (paragraph 4.1.2). Paragraph 8.1 states that the amplifier input and output references are not to be connected to the power ground (rack ground). Do the input and output instrumentation ground references need to be isolated from each other?

**ANSWER: Yes**

Question: If so, is the rack ground (chassis ground) isolated from the output ground? Are the channel output grounds isolated from each other? Do you require galvanic isolation or can a resistive isolation barrier be utilized?

**ANSWER: Galvanic isolation is not required.**

Question: Where does NASA reference the amplifier ground, excitation ground, output ground, equipment ground and control ground? A diagram showing how NASA connects excitation power, signal input leads, output leads and above grounds for two or more channels would be helpful to understand your requirements.

**ANSWER: Each test facility contains three ground busses, an instrumentation bus to which the amplifiers are connected, a power bus, in which system power grounds are connected, and a controls bus, which the return side of the 28 VDC circuits are connected, each of which connect to a single point ground connection within the facility, referred to as a "mecca". Each of these busses is isolated from each other, except for the connection at the "mecca".**

Question: 8.4.1.5 You have introduced a command for AC/DC coupling but this requirement was not described in the instrumentation amplifier specs. Do the instrumentation amplifiers require programmable AC/DC coupling? If so, what are the specs for the AC/DC coupling?

**ANSWER: This response was previously provided in responses to vendor questions. Please refer to those responses. However, 1 Hz is the lower cutoff frequency for the AC Coupling function. AC/DC Coupling functions are required to be programmable.**

Question: 8.4.2.13 You have introduced a command for resistive substitution. Please describe the requirements for the NIST traceable resistive substitution. Is this substitution for a quarter bridge configuration only? Does NASA supply the substitution resistors? If so, what are the physical sizes of

the substitution resistors?

**ANSWER:** These requirements shall be removed, as they intended to refer to the internal voltage substitution calibration function described in Section 4.1.4. However, the commands to perform this function are already specified in 8.4.2.6, 8.4.2.15, and 8.4.2.16.

Question: 9.0 Please describe the requirements for the monitoring of DSC outputs, inputs and excitation. Is this a programmable monitor or are test points required? If test points are required, is there a safety concern since many of the test points would be on isolated circuits that may have high CMV?

**ANSWER:** The choice of programmable monitor or test points shall be made by the vendor. NASA prefers programmable monitors, however, is not willing to impose this as a requirement, thus, test monitor points are acceptable as well. Vendor shall indicate safety concern with test monitor points in product literature.

Question: 17.0 The MTBF requirement is 50,000 hours. How many channels and what conditioner types (bridge, charge, etc) should be assumed for the calculation?

**ANSWER:** The specification indicates that the MTBF is to be at least 50,000 hours per system. Due to the variety of organizations available, each vendor is to define to NASA, what constitutes a "system". This is also required in the specification.

//////////////////////////////////////END OF AMENDMENT//////////////////////////////////////