

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT			1. CONTRACT ID CODE	PAGE OF PAGES	
				1	5
2. AMENDMENT/MOD NO. 1	3. EFFECTIVE DATE 2/27/2009	4. REQUISITION/PURCHASE REQ. NO. N/A		5. PROJECT NO.	
6. ISSUED BY Belford Johnson/ BH2 2101 NASA Parkway Houston, TX 77058	CODE BH2	7. ADMINISTERED BY NASA Johnson Space Center Belford Johnson/BH2 NASA Parkway - Houston, TX 77058		CODE BH2	
8. NAME AND ADDRESS OF CONTRACTOR (No. Street, County, State and ZIP Code) Prospective Offerors			(9)	9A. AMENDMENT OF SOLICITATION NO NNJ09276878R	
			<input checked="" type="checkbox"/>	9B. DATED (SEE ITEM 11) 2/20/09	
			(10)	10A. MOD. OF CONTRACT/ORDER No	
CODE			<input type="checkbox"/>	10B. DATED (SEE ITEM 13)	
FACILITY CODE					
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. 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 DATE 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 date specified.					
12. ACCOUNTING AND APPROPRIATION DATA (if required)					
N/A <span style="float: right;">Financial Management</span>					
13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.					
<input 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 checked="" type="checkbox"/> D. OTHER (Specify type of modification and authority) Amendment to Solicitation					
IMPORTANT: Contractor (is or is not) required to sign this document and return ___ copies to the issuing office.					
14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)					
The purpose of this Amendment is to: 1) Extend the current offer due date 2) Provide changes to the Statement of work, Section J.1 Paragraph 3.2.7.3 "Supply Voltage Drop-Out" , Page 49 3) Submit answers to question that have been received regarding the subject solicitation.					
The current offer due date of March 2, 2009 has been changed to March 6, 2009.					
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		
			Ann E. Bronson (Contracting Officer)		
15B. CONTRACTOR/OFFEROR		15C. DATE SIGNED	16B. UNITED STATES OF AMERICA		16C. DATE SIGNED
(Signature of person authorized to sign)					3/2/09
				(Signature Of Contracting Officer)	

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Questions Set 1:

Sec. 1.3.1 of "DESCRIPTION/SPECIFICATIONS/SOW" - describes the Supply Voltage Drop-Out Failure Mode as "continue operation or limited functionality in the absence of power without failing closed or fully-open"

Section 3.7.3 of "TECHNOLOGY DEVELOPMENT SPECIFICATION...PVR" - describes the Supply Voltage Drop-Out failure mode as "The PVR shall maintain its current pressure setting in the event that the power supply is interrupted"

If 1.3.1 takes precedence, then kindly define "limited functionality"

If 3.7.3 takes precedence, then what are the limits on the regulated pressure tolerance in the event of an electrical failure?

Answers to Question Set 1:

Section 1.3.1 of the SOW was intended to be an elaboration; it has no bearing. The requirement that covers the "supply voltage drop-out" scenario is Section 3.2.7.3 excerpted below:

**3.2.7.3 SUPPLY VOLTAGE DROP-OUT**

The PVR shall maintain its pressure setting between 28.3kPa [4.1 psid] and 41.4kPa [6.0 psid] in the event that the power supply is interrupted for a duration not longer than 5 minutes.

Rationale: This improves the overall reliability of the system given that loss of power due to failure of a single component such as a battery could result in premature depletion of the primary and secondary oxygen supplies were the regulator not capable of maintaining the specified setting. The lower bound provides operational margin over the upper end of the Secondary Oxygen Regulator (SOR) and the upper end results in a mid-range pressurization of the suit.

Question Set 2:

Is there a secondary (back-up) GOX system? If so, how does this system tie into the primary system? Is the secondary system purely mechanical? If so, is it activated in the event of an electrical power loss?

Answer to Question Set 2:

The current suit design is very similar to the Shuttle EMU in that it uses a nested regulator approach. The Secondary Oxygen Assembly includes a mechanical regulator set to a lower regulation band ~26kPa [3.8 psid] on the upper end. It is activated at the beginning of an EVA and sits as a standby redundant system in

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lockup waiting to regulate suit pressure should the primary system fail.

Question set 3:

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Does a fluid schematic of the envisioned GOX system (primary & secondary) exist? If so, can it be shared?

Answer to Question Set 3:

The Constellation Space Suit Portable Life Support System schematic does exist but is currently under SBU limitations due the pending CSSS contract so I cannot share it at this time. The specification along with the answers herein should provide an adequate description of the task.

Question Set 4:

Can the proposal submittal deadline be extended by one week to 3/13/09?

Answer to Question set 4:

The current offer due date of March 2, 2009 has been changed to March 6, 2009.

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The PVR shall, under quiescent operating conditions, not exceed a current draw of 20mA.

*Rationale: The selection of the quiescent power consumption was driven by the goal of reducing the powered, but not active operating current draw to below .5W.*

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### 3.2.7.4 START-UP TIME

The PVR should be capable of meeting operating requirements within 2 seconds from the time power is applied.

*Rationale: This is a relatively arbitrary specification value at this point. However, as the CSSE evolves, constraints will be applied for response times for power-loss recovery, etc. The value was chosen as "nearly instantaneous" with respect to the Crew observation for a power restart.*

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### 3.2.8 MASS

The PVR shall have a mass that is less than [1.6 kg] 3.5 lbs in flight configuration.

*Rationale: The mass value is seeking an improvement noting that the Shuttle EMU SOP Regulator is 4 lbs and the operating pressures are 2x higher.*

### 3.2.9 VOLUME

The PVR shall have a volume that is less than 410 cc [25 in<sup>3</sup>].

*Rationale: The volume is based on a form-factor of 6.4 cm [2.5in] diameter cylinder with a 13cm [5 in] length with the assumption that the cylinder form-factor is mounted transverse to the Primary Oxygen Vessel (POV) center-line. Volume requirements will be housed in the ICD which defines the interfaces to the PLSS. Minimizing the volume is a goal for the development process as the regulator design matures.*