Request For Proposal
for
Technical Consulting on Quad-shaker Vibration System

November 2014

Space Environment Test Team
Korea Aerospace Research Institute

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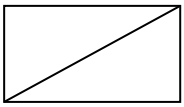

IMPORTANT

1. This RFP should be kept in confidentiality and should neither be copied nor distributed to the third parties.

2. The questions and opinions on this RFP can be asked or suggested to Korea Aerospace Research Institute before submission of the proposal.

3. This RFP should be returned to Korea Aerospace Research Institute with bidder's proposal.

4. This RFP shall be legal bind after the contract is awarded unless the bidder explicitly expresses the differences from the RFP in the compliance sheet.

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I. OVERVIEW

1. Overview of the project

1.1 Korea Aerospace Research Institute (hereinafter referred to as “KARI”) is located at Daeduk Research Complex, 140 km south of Seoul.

1.2 KARI has a satellite assembly, integration and test center (hereinafter referred to as “AITC”) for joint use by corporations and research institutes for the purpose of the effective development of domestic satellites. And basic facilities and equipment for satellite assembly and test have been supplied, installed and used.

1.3 To increase the vibration shaker capability and improve the accessibility to satellite for the safe environmental testing, new guided expander system with quad shakers will be designed and built.

1.4 The purposes of this project is to supply the technical consulting work to establish the quad-shaker system of vertical configuration

1.5 All the descriptions in this RFP are minimum requirements and the supplier can suggest the better one to improve the overall performance and cost. But in this case, the proposal should clearly indicate the improvements from KARI’s requirements.

2. Requisites of participants

2.1 The participants shall also have experience of management, integration, installation and acceptance test for the 3m guided quad-shaker system equipped with electro dynamic shakers of 640kN.

3. Scope of the work

3.1 The Contractor shall supply the technical consulting work as followings;

- ✓ Statement of work and Technical requirements for four-shakers
- ✓ Acceptance test for four-shakers

- ✓ List of manufacturing Key Inspection points for quad-shakers
- ✓ Acceptance test for overall system
- ✓ FMECA [Failure modes, effects and critical analysis] analysis on similar four shakers system
- ✓ Review on shaker supplier proposal
- ✓ Review on quad-shaker design

II. Technical Requirements

1. Quad-shaker System Configuration

To increase the shaker capability and improve the accessibility to test object, new guided expander system with quad shakers shall be designed. The head expander should be designed with magnesium material for reducing the weight. Seismic mass should be designed to support dynamic load during the vibration test and also supply the rigid support and load path for the hydraulic bearings. Quad-shakers should be used to increase the capability. Top level of H/E is designed to same level of facility floor.

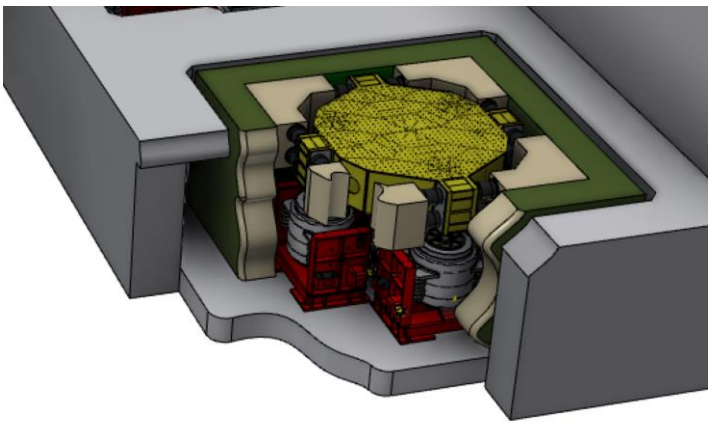

Figure 1 Concept for Quad-shaker System

Table 1. Technical requirements for Quad-shaker System

Quad-shaker System	Specification	
Table mass	<2600kg	
Table dimension	3.25m x 3.25m	
Excitation range Sine Random	 5-2000 Hz 10-2000 Hz	
Max payload mass	10 ton	
Max overturning moment	200kNm	
First pseudo rigid mode in operational status bare table	>50 Hz	
Elastic modes	>170 Hz	
Cross axis response bare table 5-150 Hz 150-400Hz	 < 10 % < 100 %	
Homogeneity bare table 3-100 Hz	<± 15 %	

2. Work Description

2.1 WP #1 Statement of work and Technical requirements for four-shakers

Objective	To generate the SOW and technical requirements for four-shakers
Activities	- Generate the statement of work for four shakers - Generate the technical requirements for shakers - Generate the Amplifier requirements - Generate the system requirements - Generate the maintenance requirements - Generate the guidelines for preparing statement of work
Outputs	- Documentation on SOW and technical requirements - Guidelines for preparing SOW

2.2 WP #2 Acceptance test for four-shakers

Objective	To check the readiness of four-shaker and review the results of acceptance test
Activities	- Generate four shakers acceptance plan on site - Provide acceptance test results of similar system
Outputs	- Four shakers acceptance test procedure - Similar four shakers acceptance test result report

2.3 WP #3 List of manufacturing Key Inspection points for quad-shakers

Objective	To check the Key inspection points for quad-shakers
Activities	- Generate the list of manufacturing key inspection points for shakers
Outputs	- List of manufacturing key inspection points

2.4 WP #4 Acceptance test for overall system in KARI

Objective	To check the readiness of overall system
Activities	- Generate the list of manufacturing key inspection points for overall system - Generate the overall system acceptance test procedure - Provide similar system acceptance test results report
Outputs	- Overall system acceptance test procedure - Similar system acceptance test result report

2.5 WP#5 FMECA analysis on KARI quad-shaker system

Objective	To check the safety logic for overall system
Activities	- Provide similar four shakers system FMECA report
Outputs	- Similar four shaker system FMECA report

2.6 WP#6 Review on shaker supplier proposal

Objective	To review on shaker supplier proposal
Activities	- Review the shaker supplier proposal
Outputs	- Review report on shaker proposal

2.7 WP#7 Review on quad-shaker design

Objective	To review on quad-shaker design
Activities	- Review the overall quad-shaker design
Outputs	- Review report on quad-shaker design

III. Format of Proposal

The proposal shall consist of 5 Sections (S).

S 1 : Bidder's Qualification Document
S 2 : Overview and Technical Proposal
S 3 : Work Schedule Plan
S 4 : Documentation
S 5 : Price Proposal

The bidder shall present 6 copies of the proposal. A4 or letter size paper shall be used. ***The bidder is requested to strictly follow the following illustrated format (tabular form)***. This is very important to compare and evaluate different bidders' proposal. Consequently, disregard for this rule may end up with disqualification. Also, well-prepared and well-organized proposal will be highly appreciated and evaluated. The landscape orientation will be acceptable for tables. The suggested contents in each WP are minimum requirements and works for reminiscences. Ambiguous expression will act adversely to the bidder.

Note : The prices which are used in the proposal to calculate the final total and breakdown prices shall be distinguished from the other prices (e.g. optionally suggested parts by the bidder or KARI, . . .) by marking a.p. (applied price) after the prices. In other words, the sum of a.p. shall be the final total price proposed in the proposal.

(example)

Item	Price	Unit	Subtotal
Item #1	$ 5,000 a.p.	2	$ 10,000
Item #2	$ 4,000 a.p.	1	$ 4,000
Item #3	$ 2,000 a.p.	3	$ 6,000
:	:	:	:
		Total	$ 20,000

S1 : Bidder's Qualification Document

The followings shall be included in this WP.

(a) Bidder's experiences on the prescribed system in this "Request for Proposal" including :

- design/ management/ integration/ installation/ acceptance test

(b) ***Bidder's Qualification Evidence Documents*** to show the capability to perform the technical consultings.

S2 : Overview and Technical Proposal

Concise and clear expression is required. A long sentence should be broken down into several sentences. Detailed block diagrams, figures and photos are recommended for clear illustration.

The bidder should prepare tables for the check list to show the bidder's compliance with the "Request for Proposal **[S1 to S5 in Work description]**". ***The bidder's compliance list shall be legal bind.*** This table shall be located in the front of Overview part. The article numbers in the "Part I. Overview" and "Part II. Technical Requirements" in the RFP should be completely enumerated in the table. The table format to be followed is as follows:

Check List for "Part I. OVERVIEW", "Part II. TECHNICAL REQUIREMENTS", "Part Ⅲ. Warranty, Maintenance and other Requirement" and "Part Ⅳ Terms and Conditions"(**COMPLIANCE LIST**)

ANR : Article Number in the Part I and Part II in the RFP

Y/N : Compliance (Yes or No)

CAP : Corresponding Article number in the bidder's Proposal to ANR

AAM : Article number of Added Material in the bidder's proposal which is not mentioned in this RFP

(Exemple)

ANR	Y/N	CAP	Remark	AAM	Remark
I-1.	yes	I-1.1	Ditto		
I-2.	yes	I-2.1.1	Ditto		
I-2.1.	yes	I-2.1.2.	Ditto		
…...	……	……			
II-1.	yes	II-1.1	Ditto		
II-2.	yes	II-2.1.2.	Ditto		
II-2.1.	yes	II-2.1.3.	Ditto		
II-2.1.1.	yes	II-2.1.5.	The specifications look old. We updated them		

N/A	N/A	N/A	N/A	II-2.1.4.	We currently developed a new method.
II-2.1.2.	yes	II-2.2.1.	Ditto		

WP 3 : Work Schedule

The work schedule shall be shown as in detail as possible in chronological way.

- Table for work schedule

WP 4 : Documentation

9.1. Documentation

- document list (contents) to be delivered

WP 5 : Price Proposal

8.1.Total price :

All the Price Proposal shall be separately submitted being sealed.

Note :

The prices which are used in the proposal to calculate the final total and break-down prices shall be distinguished from the other prices (e.g. optionally suggested parts by the bidder or KARI, . . .) by marking a.p.(applied price) after the prices. In other words, the sum of a.p. shall be the final total price proposed in the proposal.

The total price is the sum of the break down prices hereafter.

APPENDIX

1. General Terms and Conditions