

Request For Proposal
for
Large Slip Table System
for Large Vibration Test Facility



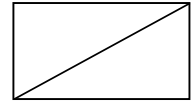
September 2015

Space Test Division

Korea Aerospace Research Institute

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for
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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 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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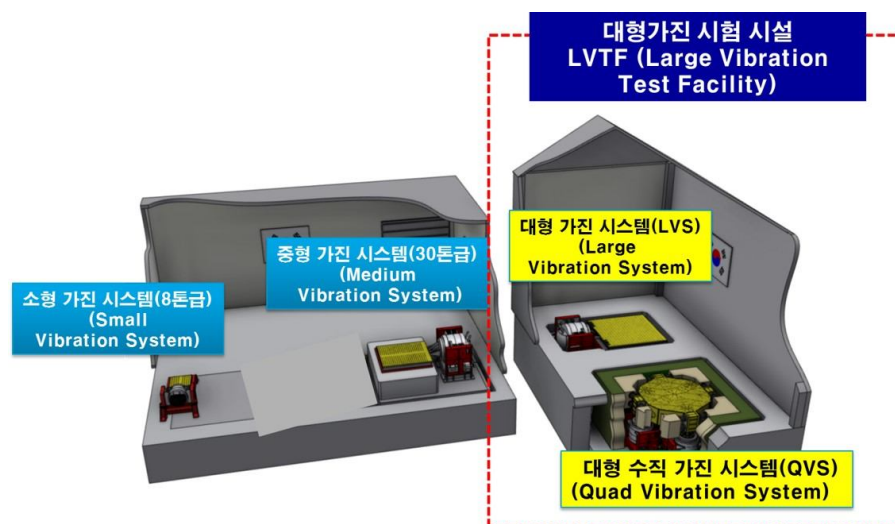
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I. OVERVIEW

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 large vibration system will be designed and built which is equipped with slip table with 3.25m interface.



- 1.4 For these reasons, KARI would like to procure slip table system and related interface equipment.
- 1.5 The purposes of this project are ;
 - 1.5.1 To supply new slip table system
 - 1.5.2 To modify the seismic mass design & drawings to accommodate the supplied slip table system
 - 1.5.3 To supply the related all hydraulic equipment (including sensors and , filter, electrical cabinet and lines)

The work covers the procurement and the installation of the slip table and interface equipment including:

- ✓ Slip table system Analysis & Design
- ✓ Slip table system Manufacturing and Testing at factory
- ✓ Slip table system Installation and Acceptance Testing at KARI

The performance of the slip table system shall meet the requirements as detailed in the II Technical requirement.

- 1.6 The supplier should submit the proposal of the slip table system to KARI.
- 1.7 All the descriptions in this RFP are minimum requirements and the supplier can suggest a 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 supply information about themselves including organization, financial standing, major business, experience in manufacturing and delivery performance for at least five (5) years and technical support.
- 2.2 The participants shall have experience in manufacturing and delivery of the Large Slip Table System.

3. Work description

3.1 WP S1000 Slip Table System Management

3.1.1 General

An effective and economical management of the Project shall be conducted. A Project Manager shall be responsible for the management and execution of the work to be performed.

3.1.2 Access

The KARI shall be allowed free access to any plan, procedure, specification or other documentation relevant to the work. Areas and equipment used during the development/testing activities shall also be available for inspection and audit.

The KARI shall be notified at least three weeks before the start of any test program, or as mutually agreed, in order to enable the KARI to select those tests that it wishes to witness. The KARI shall notify its visit at least three week in advance.

3.2 WP S2000 Slip Table System Design

3.2.1 Design

The design of the slip table system and interface shall be carried out. Since the slip table system shall be integrated in the seismic foundation to be designed and connected to the shaker, a complete F.E.M analysis for whole system shall be provided.

3.2.2 Design Review (DR)

Upon successful completion of the Design Review (DR) meeting the KARI shall authorise manufacturing and assembling of the relevant equipment. From that time on, a configuration control system for the documentation and drawings shall be established. All changes to the design shall be processed via Contract Change Notice (CCN) to be approved by KARI.

3.2.3 Deliverables: Design Review Data Package

The following documents shall be handed over to the KARI 2 weeks prior to the DR:

- 3.2.3.1 *System analysis & calculation report*
- 3.2.3.2 *Finite Element model (Nastan input file)*
- 3.2.3.3 *Overall drawings of reaction mass (2D, dwg format)*
- 3.2.3.4 *Detail drawings of mechanical parts of the reaction mass (2D, dwg format)*
- 3.2.3.5 *Instructions for the fabrication of the reaction mass*
- 3.2.3.6 *Steel reinforcement and form drawings (2D, dwg format)*
- 3.2.3.7 *Overall slip table system drawings including shaker & seismic mass
(3D, STP format)*
- 3.2.3.8 *Theoretical analysis of hydraulic bearings*
- 3.2.3.9 *Measurements supporting the equipment performance specifications*
- 3.2.3.10 *Factory Acceptance Plan*
- 3.2.3.11 *Site Acceptance Test Results in similar slip table system of 3m x 3m for
reference*

3.3 WP S3000: Slip Table System Manufacturing

During this work package the following tasks shall be performed:

3.3.1 Manufacturing

The system hardware shall be manufactured according to the design accepted under WP S2000.

All manufacturing operations shall be planned in co-ordination with inspections and tests. This planning shall be documented in a concise Manufacturing and Inspection Plan.

3.3.2 Factory acceptance

The Factory Acceptance objective is to verify that the requirements detailed in technical requirements are fulfilled.

The factory acceptance tests and inspections shall be performed according to a Factory Acceptance Plan, which shall identify all the activities to be performed and the requirements intended to be verified.

The Factory Acceptance Review meeting in order to review the results of the implementation of the Factory Acceptance plan shall be organised.

A board composed of members to be agreed with the KARI's representatives shall attend the Factory Acceptance Review meeting and confirm that:

3.3.2.1 *All the equipment to be delivered is ready to be shipped.*

3.3.2.2 *The functional verification are fulfilled.*

3.3.2.3 *Drag force of slip table is measured in empty condition & loaded condition of 11 tons*

This task shall be completed upon a successful Factory Acceptance Review.

3.3.3 Deliverables:

3.3.3.1 *Exhaustive list of the equipment to be shipped*

3.3.3.2 *Factory Acceptance test reports*

3.3.3.3 *Factory Acceptance Review minutes of meeting*

3.3.3.4 *KARI on site Acceptance Plan*

3.4 WP S4000 Slip Table System Installation and Testing

During this work package the following tasks shall be performed:

3.4.1 Mechanical installation.

The mechanical installation comprises the:

- Connection of the slip table system with reaction mass
- Alignment of bearings if needed
- Installation of hydraulic group

3.5 WP S5000: Slip Table System Acceptance testing

Upon completion of the installation of the slip table system, the acceptance testing of the slip table connected with shaker shall be took place according to the Acceptance Plan.

The acceptance tests shall be performed in accordance with formal test procedures and documented in test reports.

The draft operation manual will be used during the acceptance test to confirm its suitability to support the operation of the system. KARI staffs and other authorized persons will be trained on the operation of the system during the acceptance test.

The Acceptance Plan shall cover all tests and verifications.

During this work package the following tasks shall be performed:

3.5.1 Acceptance test sequence

The acceptance tests shall verify the capability of the slip table capacity in compliance with KARI specification. The following tests have to be performed:

- 3.5.1.1 *Drag force measurement test*
- 3.5.1.2 *Bare condition performance tests*
- 3.5.1.3 *Loaded condition performance tests with dummy load*
- 3.5.1.4 *Abort sequence verification*

3.5.2 Acceptance review and acceptance data package

An Acceptance Review (AR) shall be performed to review the results of the implementation of the Acceptance Plan. A Board composed of KARI representatives shall perform the Acceptance Review.

3.5.3 Deliverable

The AR shall be supported by an Acceptance Data Package (ADP). The ADP shall be provided two weeks prior to the review in 2 paper copies and electronic copy. The ADP shall comprise the following documents:

3.5.4 System Description Document

A system description document;

3.5.4.1 *Mechanical Drawings*

- *All mechanical drawings necessary for the installation and maintenance of the equipment, stating dimensions, weights and attachment points*
- *Electrical drawings comprising:*
- *Overall functional block diagram (with reference to the equipment by drawing, or equipment number)*
- *Test points and test values*
- *Terminal lists*
- *Drawing list of the delivered drawings*

3.5.4.2 *Copies of all Non-conformance Reports and Requests for Waiver*

3.5.4.3 *Manufacturing Inspection Report*

3.5.4.4 *Acceptance test plans, test procedures and test reports*

3.5.4.5 *System Operation Manual*

The system operation manual shall describe the aspects of the operation of the equipment in a logical order, to ensure a safe and proper use. This manual shall contain the following chapters:

- Pre-operational checks
- Start-up and safe shut-down
- Operation of equipment and auxiliaries
- Inspections

Note: This document should be written such that it can be used as a stand-alone manual for the facility operator without necessarily consulting the other documents.

3.5.4.6 *Maintenance manual*

The maintenance manual shall describe the aspects of preventive and corrective maintenance. This document shall clearly distinguish between activities that require the special knowledge of the supplier and the activities that can be done by trained KARI personnel.

This document shall include the procedure to remove and re-install the top plate and installation and alignment procedure of the bearings.

3.5.4.7 *Spare part list*

A recommendation concerning the spare-parts list covering a period of 5 years of operation shall be made and the guarantee that spare-parts can be made available for another 10 years thereafter shall be given.

Delivery time shall be stated for all for spare parts.

4. Management reporting Meetings and Deliverables

The hardware, Drawing & Documentation deliveries shall include, as a minimum, the following:

Item No.	Part name	Qty	Description
1	Large slip table	1	<ul style="list-style-type: none"> - Slip plate - T-film bearings - Stiff structure supporting T-film bearings - Small slip plate & Cleanness cover
2	Auxiliary equipment	1	<ul style="list-style-type: none"> - Hydraulic group - Drive bar - Specific tooling for maintenance (Alignment) - Electric cabinet with cables - Flexible hoses
3	Drawings	1	<ul style="list-style-type: none"> - User drawings for slip table system <ul style="list-style-type: none"> ✓ Assembly drawings ✓ Overall drawing - Drawings for reaction mass
4	Documents	1	<ul style="list-style-type: none"> - Analysis report & F.E.M model - Theoretical analysis of hydraulic bearings - Operating & Maintenance manual - Instructions for the fabrication of the reaction mass - Factory Acceptance Plan - Site Acceptance Plan - Site Acceptance Test Results of 3m

Kick-off/PDR/CDR/MRR/TRR/FAR/SAR reviews shall be held.

Review	Purpose
Kick-off	-Review the requirements of the system -Understand and agree the design baselines
Design Review	- Verify the compatibility of the design definition and predicted performance with system requirements - Verify the coherency of the equipment specifications with the subsystem specification
Test Readiness Review	- Review test plans, sequences and procedures
FAR (Factory Acceptance Review)	- Final acceptance of slip table in Factory - Review test results (Checking key requirements' performance consistency)
SAR (Site Acceptance Review)	- Site acceptance of slip table in KARI - Review test results (Checking key requirements' performance consistency)

5. KARI's undertakings related to the slip table system

The following items are provided as KARI's Undertakings:

1. Handling of the table and hydraulic group from the unloading bay to KARI site
2. Electrical connection of hydraulic group on KARI electrical network
3. The connection of the hydraulic group on KARI chilled water network
4. Electrical cabling work between hydraulic group and table
5. The alignment of the shaker with slip table
6. 10 tons dummy for site acceptance testing
7. Lifting crane of 20 ton

6. Warranty

- 6.1 The system shall be warranted for a duration of 1 years from the date of definitive acceptance on the site against any operational faults. The date of acceptance is the date when the whole system is completely installed and its function is approved perfect in a written format by KARI or its representative.
- 6.2 The warranty covers the replacement of faulty parts, the labor required for repair, traveling cost, living fees and all associated necessary costs.
- 6.3 The contractor or A/S teams shall submit the written plan for repair within 48 hours after the reception of the notification of fault. The contractor or A/S teams shall completely finish the repair within 30 days after the reception of the notification of fault.
- 6.4 For an urgent service during important testing period, the deadline for action is 5 days from the reception of the notification of service. To meet the deadline of the urgent service, KARI will notify the contractor of the test start date and the period 2 weeks before the test start date. The contractor shall stand by the A/S crews at contractor's convenient place during the test period (up to 4 weeks).The contractor shall include a plan for these requirements in the proposal.
- 6.5 To meet these requirements, the contractor shall propose a detailed plan for the prompt repair in the proposal. The detailed information (location, number of crews, resume, phone and FAX numbers, e-mail address, etc.) of the A/S teams shall be shown in the proposal and shall be approved by KARI.

7. Product supply schedule

The contractor shall meet the key points schedule as below;

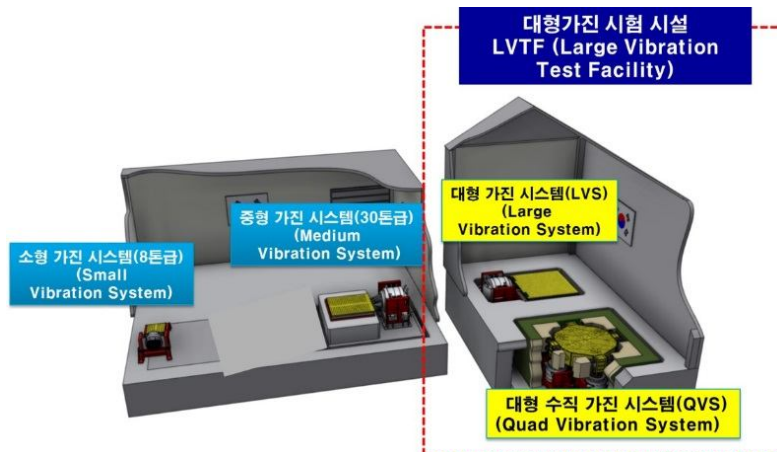
(The supply schedule can be adjusted based on the building construction schedule in KARI)

Items	Key Points Schedule
Slip Table	<ul style="list-style-type: none">- Arrival at KARI : January 2017- Installation & Finish site acceptance : March 2017

II. Technical Requirements

1. Total System Configuration

This document covers the technical requirements applicable to the slip table system for lateral vibration testing [LVS at Figure shown below].



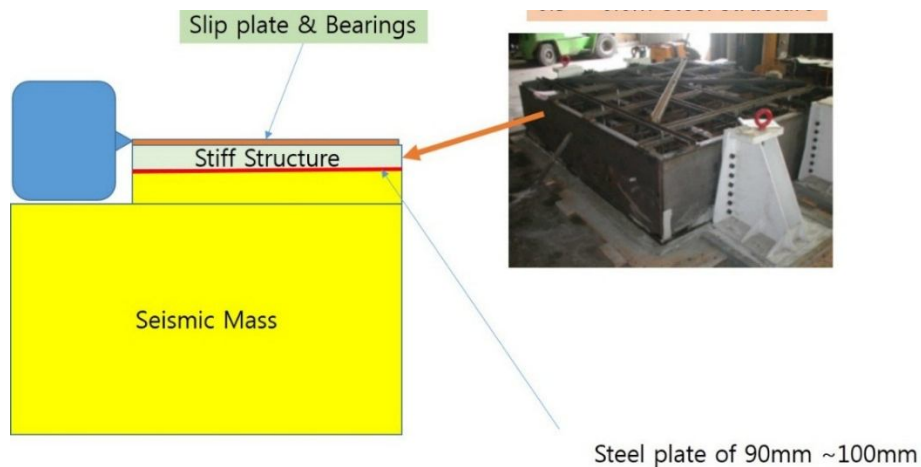
2. Technical Requirements for Slip Table System

Slip table system is composed of slip plate, T-film bearings, bearing installation structure, stiffness structure and hydraulic group.

The work scope for slip table system is

- Firstly to design the slip table with T-film bearings and the reaction mass,
- Secondly to supply the slip table with hydraulic group,
- Thirdly to suggest smaller table design which can be used in clean room class.

The figure as shown below represent the configuration of slip table system.



2.1 Slip Table System Requirements

In this proposal, slip table system shall meet the requirements described below.

[Req_1] Slip plate requirement

The slip plate of slip table system shall have the following requirement as minimum:

Req_1.1	Interface area of slip plate	- 3.25m x 3.25m - Accommodate max 3.6m(D) object
Req_1.2	Moving mass (including drive bar)	< 2000kg
Req_1.3	Displacement	50mm peak to peak (operation)

[Req_2] Interface requirement

The interface of slip table system shall have the following requirement as minimum:

Req_2.1	With shaker	LDS V994
Req_2.2	With specimen : M12 inserts	100mm x 100mm grid
Req_2.3	Table top surface flatness	< 0.04 mm/m
Req_2.4	Roughness	< 3.2 μ m
Req_2.5	With clean room	Molecular contamination < 2.10 ⁻⁷ g.cm ⁻²

[Req_3] Operational frequency range

The operational frequency of slip table system shall have the following requirement as minimum:

Req_3.1	Sine	3H ~ 2,000 Hz
Req_3.2	Random	10H ~ 2,000 Hz

[Req_4] Loading capabilities

The loading capabilities of slip table system shall have the following requirement as minimum:

Req_4.1	Payload mass	11,000kg
Req_4.2	COG above the table	5,000mm
Req_4.3	Max excitation force	280kN
Req_4.4	Max lateral force	90kN
Req_4.5	Max vertical force	40kN
Req_4.6	Max pitch moment	1300 kNm
Req_4.7	Max yaw moment	80kNm
Req_4.8	Max roll moment	700kNm

[Req_5] Input acceleration

The acceleration control of slip table system shall have the following requirement as minimum:

Req_5.1	Controllability outside resonance frequencies: Sine : 3-100Hz 100 – 2000Hz Random	+/-1 dB or 0.025g +/-3 dB +/-3 dB
Req_5.2	Controllability through resonance frequencies: Sine : 3-100Hz 100 – 2000Hz Random	+/-6 dB or 0.025g +/-6 dB +/-6 dB
Req_5.3	Deviation of acceleration from excitation acceleration: 3-100Hz 100 – 2000Hz (excluding isolated peaks)	< +/-10 % or 0.025g < +/-30 %

Req_5.4	Cross-axis response 3-100Hz 100 – 1000Hz 100 – 2000Hz	< +/-10 % or 0.025g < +/- 20 % < +/-100 %
Req_5.5	Distortion in excitation direction: 3-100Hz 100 – 2000Hz (excluding isolated peaks)	< +/-10 % or 0.025g < +/-20 %

[Req_6] Global stiffness

The global stiffness of slip table system shall have the following requirement as minimum:

Req_6.1	Empty table	> 380Hz
Req_6.2	Through full range	> 150 Hz

[Req_7] Bearing type

The bearing type of slip table system shall have the following requirement as minimum:

Req_7.1	Yaw bearings
Req_7.1	T-shape linear hydrostatic bearings

[Req_8] Drive adapter for shaker

The drive adapter of slip table system shall have the following requirement as minimum:

Req_8.1	Magnesium material
Req_8.2	To mate with LDS V994 shaker

[Req_9] Stiff structure

Stiff structure should be designed to increase the performance of the system and be optimized using F.E analysis.

Anchoring of the stiff structure on the reaction mass should be designed to connect not only at the periphery but also in central part of stiff structure.

Stiff structure should be designed to fit with casing for the oil and collectors for outlet of the bearings. The height of stiffness structure is about 500mm. Detailed height should be decided through the F.E. optimization process under KARI approval in design meeting.

[Req_10] Reaction mass design

For reference, the reaction mass design and drawings will be supplied. The bidder shall modify the reaction mass design to accommodate the configuration of slip table system. Also the bidder can design new reaction mass. The performance should be predicted in the analysis report.

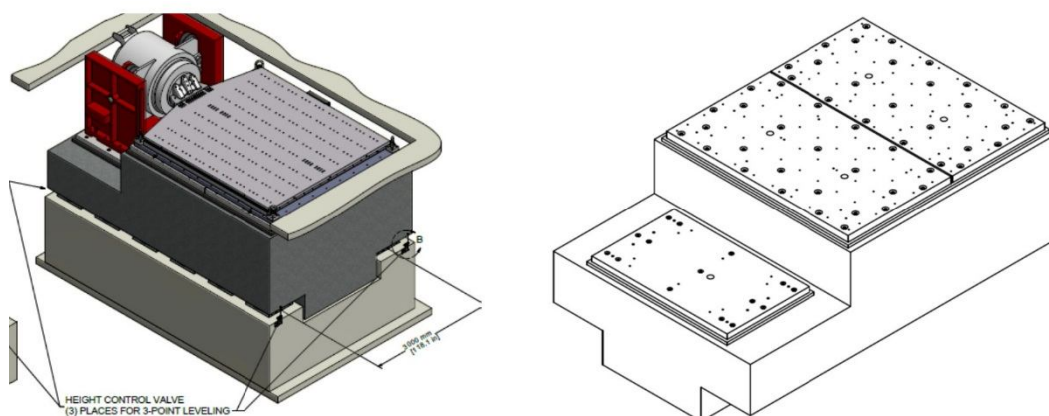


Figure 1 Reaction mass design [For reference]

Req_10.1	Supply overall drawing of the reaction mass
Req_10.2	Supply detail drawings of mechanical part of reaction mass
Req_10.3	Supply fabrication procedure of the reaction mass
Req_10.4	Review on civil engineering drawings

[Req_11] Hydraulic group

The hydraulic group of slip table system shall have the following requirement as minimum:

Req_11.1	Supply Hydraulic pump & Utilities
Req_11.2	Supply the pressure sensor, temperature sensor, oil level sensor
Req_11.3	Supply the electrical cabinet
Req_11.4	Hydraulic hoses

[Req_10] Smaller table

Smaller top plate shall be proposed as an option. The purpose of smaller plate is to save mass for the tests on smaller payload and have higher longitudinal mode.

Smaller top plate should be composed of top plate and walkable panels. Also it should be compatible with clean room 100,000 class.

The size of smaller table have dimension of about 2m. The participant shall showing the moment capacity for the Case #1 as shown below. Also participant shall propose the method to reduce the moving mas by selection of material and thickness of slip plate.

[Req_10] Overturning moment capacity

To show the capacity of overturning moment in some cases of adapter, the participant should supply the moment capacity for the Case #1, Case #2 and Case #3 as shown below in the proposal.

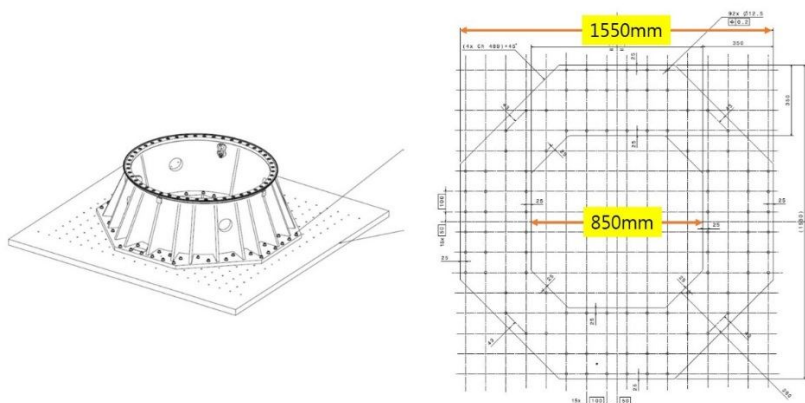


Figure 2 Case #1 Small adapter

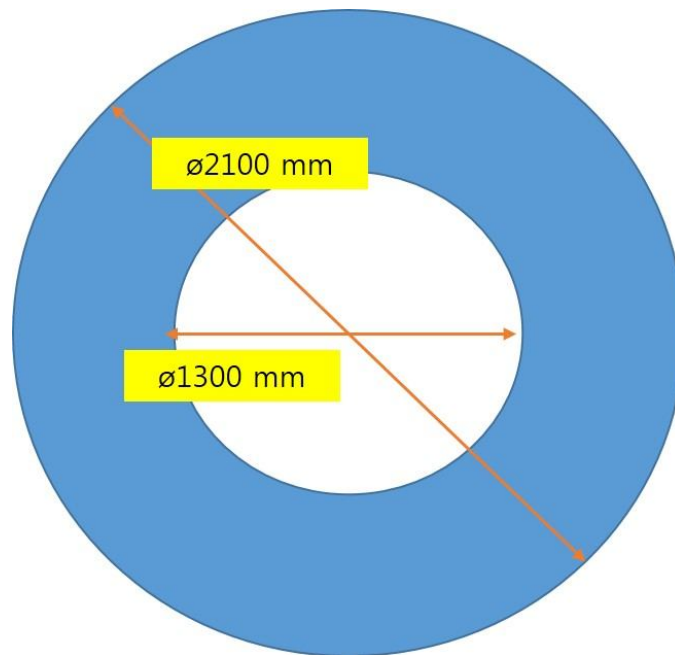


Figure 3 Case #3 Annular Interface

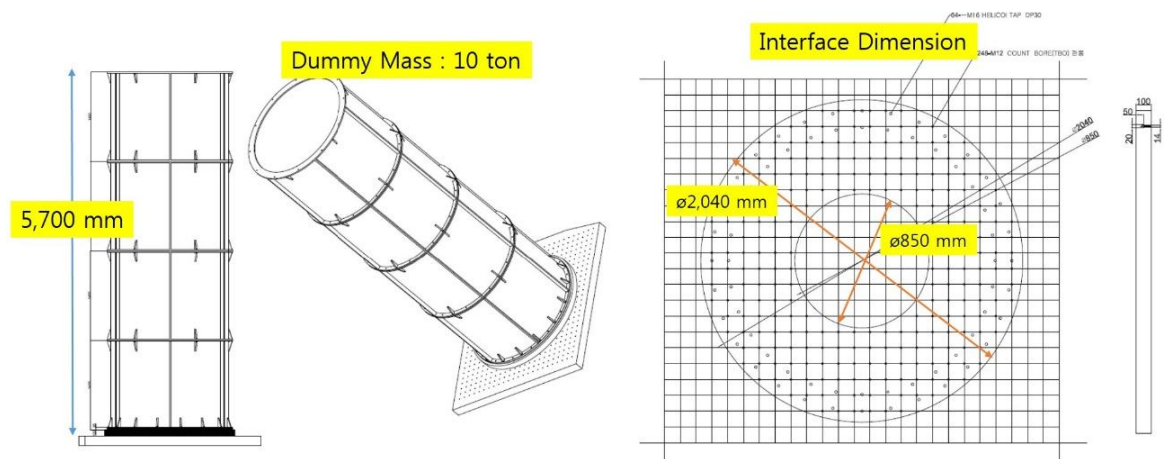


Figure 4 Case #2 KARI Dummy mass

III. Format of Proposal

The proposal shall consist of 10 section(S).

- S 1 : Bidder's Qualification Document
- S 2 : Executive Summary (Overview)
- S 3 : Technical Proposal
- S 4 : Warranty Proposal
- S 5 : Maintenance Proposal
- S 6 : Work Schedule for Manufacturing, Assembly, Installation, and Interface
- S 7 : Acceptance Test Plan Proposal
- S 8 : Resume of Key Personnel
- S 9 : Bidder's Confirmation Document for Fully Understanding of the RFP
- S 10 : 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.

S 1 : Bidder's Qualification Document

(*) Bidder's Qualification : The followings shall be included in WP1.

The participants shall have experience in manufacturing and delivery of the Large Slip Table System.

The followings shall be included in this Section.

(a) Bidder's at least last 5 years' experience on the prescribed system in this "Request for Proposal" including :

- (1) design
- (2) manufacturing
- (3) installation (specifications, performance, purchaser, supplied year, and price)
- (4) training (operation and maintenance) of the facility

- (b) The certification of export license for the items to be delivered.
- (c) The installation information (including personnel's information in charge of the facility, address, FAX number, etc.) from the well-known institutes or companies which are using the facilities installed by the bidder and/or subcontractor.
- (d) The bidder's separate balance sheets of recent 5 years, which is certified by Certified Public Account, including annual turnovers, assets and liabilities (This should be submitted separately for bidder's company only and the total group).
- (e) Other information
 - 1. Total Employees
 - Total number of Employees (Engineer / Technician)
 - Number of Employees for the directly related area
 - 2. Plant Scale
 - Total area of space
 - Factory & Building area
 - 3. General brochure
 - 4. Any documents with which the bidder can show his/her financial and technical abilities (e.g. technical awards, bank balance, etc.)
- (4) training (operation and maintenance) of the facility for foreign countries

S 2 : Executive Summary (Overview)

This section shall include the summary of the all section (3 through 12). The tabular form is recommended.

S 3 : Technical Proposal

This section (Technical Proposal) shall be written in English. 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.

All the descriptions in this RFP is minimum requirements and the bidders can suggest the better one to improve the overall performance. But in this case, the proposal should clearly

indicate the improvements on the KARI's requirements with their detail drawings and explicit calculation results.

The contents of proposal will be the measurement of the bidder's technical capabilities. Bidder's proposal will be reviewed by a number of experts at KARI and other institutes.

The bidder shall prepare tables for the check list to show the bidder's compliance with the "Request for Proposal". This table shall be located in front of the Technical Proposal part. The articles in the "Part I Work description" and "Part II Technical Requirements" of the RFP shall be completely enumerated in the table. The table format is as follows:

Check Lists for "Part I Work description" and "Part II Technical Requirements"

ANR : Article Number in the "Part II & III Technical Requirements" 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 the RFP.

	ANR		Y/N	CAP	Remark	AAM	Remark
Part I Or Part II	1)		yes	1)	ditto		
	2)		yes	2)	ditto		
	3)		yes	3)	ditto		
	4)		yes	4)	The specifications look old. We updated them.		
	N/A		N/A	N/A	N/A	5)	We currently developed a new method.
	5)		yes	6)	ditto		
	6)		no	7)	The resolution is high above the necessity. The current technology for the system		
	7)		yes	8)	ditto		
	8)		no	9)	This specification is not compatible with 8) in the proposal. We suggest other approach.		
	9)		yes	10)	ditto		

ditto : The same as stated above or before

Due to the interface issue, the bidders shall deliver a complete design file(AutoCAD or CATIA) or drawings which have the following information :

- Whole set of drawings of slip table system and driver bar with the detail layout of

interface-related system

- Slip table base plan
- Distribution network(electricity, oil, cooling water, etc) layout drawings
- Interface details with the test building
- All the calculation notes proving that the total system will be fully compliant with the technical specifications.

S 4 : Warranty Proposal

4.1 Baseline warranty (1 years)

- plan for the prompt repair
- information on A/S team

S 5 : Maintenance Proposal

5.1 General description

5.2 Spare parts

5.3 Hardware updating

S 6 : Work Schedule for Manufacturing, Assembly, Installation, and Interface

The work schedule and installation plan shall be shown as in detail as possible in chronological way. The installation plan shall be detailed enough to figure out daily progress and include the methods and procedures for interface between the equipment and KARI SITC building (electricity, cooling water, etc)

S 7 : Acceptance Test Plan Proposal

7.1 General description

7.2 Acceptance test

7.3. Back-up plan

For the case that the bidder cannot meet the requirements or other contractual binds after the contract is awarded, the bidder shall proposed the back-up plan.

- Detailed plan and schedule

S 8 : Resume of Key Personnel

The table shall include the information of the followings :

- (a) Overall project manager
- (b) Mechanical and electrical lead designer
- (c) Other section project leader
- (d) Subcontractor personnel (if any)

S 9 : Bidder's Confirmation Document for Fully Understanding of the RFP

This document shall confirm that the bidder has completely understood the whole RFP, which was written in Korean and English.

S 10 : Price Proposal**Price proposal in any currency**

IV. INSTRUCTION TO BIDDERS

1.1. Qualification of Bidders

- (1) Bidder shall have experience in manufacturing and delivery of the Large Slip Table System.
Bidder shall have at least five years of experience in the above fields.
- (2) The qualifying statement for above requirements and support materials shall be included in the Proposal.
- (3) Bidder shall be in possession of all the necessary licenses, in effect as of the Bid Closing Date, required for the development of Large Slip Table System for Large Vibration Test Facility as described in this RFP.

1.2. Submittal of Proposal

The proposal shall be hand-carried or sent via appropriate express courier to KARI personnel or his designee within the Bid Closing Date and Time. A deputy shall submit the power of attorney and a copy of his identification.

1.2.1. Number of copies

The Proposal should be made in six (6) copies in English. In case of any discrepancies between the Proposals, the original hardcopy shall prevail.

1.2.2. Bid closing date

The closing time for the Proposal October 15, 2015 is 14:00 Korean local time. If any part of the Proposal as required under this RFP is submitted after the stipulated closing time, the entire Proposal will be deemed late. KARI in its absolute discretion may exclude any late from further consideration.

1.2.3. Point of contact

Besides the Proposal submission, the point of contact for all communications for technical matters shall be

Dr. Jong-Min Lim
Space Test Division
Korea Aerospace Research Institute (KARI)
169-84 Gwahak-ro, Yuseong-Gu
Daejeon, 305-806, Korea
Tel : 82-42-860-2562
Fax: 82-42-860-2234
E-mail : acoust@kari.re.kr

The communication between KARI and prospective Bidders for contractual matters (Terms and

Conditions) shall be controlled through the following designee:

Mr. Jung-Nam CHO
Senior Administrator of Procurement Team
Korea Aerospace Research Institute (KARI)
169-84 Gwahak-ro, Yuseong-Gu
Daejeon, 305-806, Korea
Tel : 82-42-860-2613
Fax: 82-42-860-2666
E-mail : jncho@kari.re.kr

Bidder's information on the points of contact shall include the name, title/position, telephone number, E-mail address, and facsimile number.

1.2.4. Information on the evaluation

The evaluation of the Proposals will be performed by the evaluation committee in KARI. The following evaluation guidelines are for information only, and the evaluation committee reserves the right to modify the guidelines without any prior notification to Bidders.

Principles of evaluation are as follows;

- (1) Subject to an initial review of the Proposal, KARI may send to Bidders a set of questions for clarification and supplementation to the Proposal, and the evaluation will be made based on the Proposal and the answers received from Bidders.
- (2) The evaluation will be performed for the technical part of the proposal first and then for the price part, and the price proposal will be evaluated considering the quality of proposed technology and work package contents.
- (3) The evaluation committee may select a few best qualified and compliant Proposals and may request the selected Bidders to submit the best and final Proposal including cost adjustments to the items needed for normalization of the work to be performed and the specifications to be achieved.
- (4) The evaluation will be based on the baseline work scope. Any optional propositions will be evaluated separately.
- (5) The result of the evaluation is at the proposal evaluation committee's discretion based on the evaluation process and any Bidders shall not raise any objection regarding proposal evaluation committee's decision thereupon.

1.3. Bidding Schedule

The following schedule is a tentative milestone for the eventual Contract and may be changed at KARI's sole discretion:

- [1] RFP Release: T0
- [2] Proposal Closing Date: $T1 = T0 + 6 \text{ Weeks}$
- [3] Review of Proposal: $T1 + 1 \text{ Week}$
- [4] Question and Answer: $T1 + 1 \text{ Week}$
- [5] Contract Negotiation Start: $T2 = T1 + 2 \text{ Weeks}$
- [6] Expected Date of Contract: $EDC = T2 + 4 \text{ Weeks}$

If KARI and Successful Bidder fail to reach an agreement on the eventual Contract, KARI may proceed with the Contract negotiations with the Bidder of the second rank without any obligations to the Successful Bidder. The negotiation process will be continued with the Bidder of the next rank until the terms and conditions acceptable to KARI are reached.

1.4. Validity of Proposal

Proposal shall be valid for six (6) months from the Bid closing date and upon KARI's request, shall be extended for another six (6) months.

1.5. Bid Bond

1.5.1. Amount of Bid Bond

Bidder shall establish a bid bond in favor of KARI not later than the Bid Closing Date and submit the certificate to KARI along with this Proposal. The total amount of the bid bond shall be at least five (5) percent of the total bidding price. The bid bond shall remain valid for six (6) months, and if the Bid validity is extended as per Section 1.4, the bid bond shall also be extended accordingly.

1.5.2. Bid Bond Establishment Method

The bid bond in Section 1.5.1 hereinabove shall be issued by first class international bank in the form of an irrevocable letter of credit and advised through "Woori Bank" (Daejeon Branch at 29 Munye-ro, Seo-gu, Daejeon, 35241 Korea, Tel: +82-42-488-9704, Ext. 312 / Fax: +82-505-003-0759). The bond shall be available by KARI's draft at sight drawn on the Bank, accompanied by the statement of KARI stating that Bidder has refused to enter into a Contract with the terms and conditions in the RFP as amended, if any, that Bidder has hindered the fair bidding by fraud or misrepresentation, or that Bidder has withdrawn its Proposal after the Bid Closing Date. The bid bond shall contain the substantial part of the terms and conditions of the bond, date of establishment, account, amount, payment terms, and date of expiry, etc.

1.5.3. Bid Bond Return

The bid bonds except for those of the Successful Bidder and the other Qualified Bidders will be released upon the instructions of KARI to the Non-Qualified Bidders, without interest, promptly after KARI's selection of the Successful Bidder. The bid bond of the Successful Bidder and the other Qualified Bidders shall be likewise released to the corresponding Bidder with whom KARI decides not to enter into a Contract.

1.5.4. Contractor's Bid Bond

When the Contract is executed, the bid bond shall be released upon the instructions of KARI to the Contractor, without interest, promptly after the Contractor shall established a performance bond in favor of KARI.

1.6. Questions and Modifications

Any questions as to the intent and clarity of the RFP may be asked to KARI's point of contact as specified in Section 1.2.3 by E-mail, fax or letter no later than ten (10) days before the Bid Closing Date.

After the Bid Closing Date, Bidders shall not amend, modify, or supplement the Proposal, or submit any other documents to KARI, except with KARI's written request.

KARI may ask, in writing, questions as to the intent and clarity of the Proposal to Bidders or request the Bidders to provide supplementary information or data.

1.7. No Contractual Obligation

This RFP shall not be interpreted as an offer for a Contract or any type of guarantee by KARI. It is KARI's sole discretion whether or not to allow the Contract award to any Bidder. KARI owes no responsibility or obligation to select the Contractor among Bidders.

This solicitation for the Proposal shall neither be construed to create an obligation on KARI to enter into a contractual instrument, nor shall it serve as a basis for any claim for reimbursement of costs for the effort to prepare, submit, amend, revise or supplement the Proposal, and other related documents expended by Bidder regardless of whether or not Bidder is successful in receiving an award as a result of the solicitation.

1.8. Acceptance/Rejection of Bids

KARI reserves the right to accept or reject any Bidding, and to amend the Bidding process and reject all Biddings at any time prior to the award of the Contract without thereby incurring any liability to

the affected Bidder(s), and KARI is not under any obligation to inform the affected Bidder(s) of the ground for its action.

1.9. Selection of Successful Bidder

The Successful Bidder will be selected by the evaluation committee among the Bidders subject to the evaluation of the Proposals. At the time the Successful Bidder is selected, the ranking of the other Qualified Bidders will be notified.

In the event mutually agreeable terms and conditions including price are not reached with the Successful Bidder within the time limit specified by KARI, KARI may proceed with the Contract negotiations with the next ranking Bidder without undertaking a new bidding process and without any obligation to the Successful Bidder.

In case KARI initiates the Contract negotiations with the next ranking Qualified Bidder as specified in the above mention, the Bidder will occupy the position as the Successful Bidder and assume any obligations imposed upon the Successful Bidder under this RFP. The result of evaluation is at the proposal evaluation committee's discretion based on evaluation process and any Bidders shall not raise any objection regarding the proposal evaluation committee's decision thereupon.

1.10. Contract

The Contract period for the Development and Procurement of Large Slip Table System for Large Vibration Test Facilities will be from EDC to the installation and Site Acceptance.

The Terms and Conditions as presented in Chapter V. of this RFP is the baseline requirement for the Contract negotiation, and will be the basis of the Contract.

1.11. Language and Measurement Unit

The Proposal and any documents submitted to KARI under this RFP and communication and the Contract language shall be in English or Korean.

"Système Internationale" (SI, hereafter) units shall be used for measurements and quantities in the Proposal and all the accompanying documents.

1.12. Pricing Requirements

Any price or rate proposed by Bidder shall be firm and fixed, not subject to change for a price escalation for the entire period of the Contract.

Any kinds of taxes and duties arising in connection with Bidder's work under this RFP and under the

eventual Contract shall be Bidder's responsibility, except for the customs duties levied in Korea. The price shall be inclusive of any cost or charge incurred due to delivery of any equipment, hardware, software or documentation to KARI or its designated point of delivery.

1.13. Certificate and Government Approvals

Bidders shall receive the government approval and certificates (e.g. E/L) in relevant countries, necessary for Bidder's work for the Development and Procurement of Large Slip Table System. Bidder's ability and plan to get such approval and certificates shall be submitted to KARI, together with any appropriate assurance letters from the relevant governments, in the proposal.

1.14. Confidentiality

There shall be no news releases, public announcements, denials or confirmation in connection with this RFP or Contract award without the prior written approval of KARI.

All documentation submitted in response to this RFP shall be marked "COMMERCIALS-IN-CONFIDENCE" on the first page of each document. All elements of the RFP shall be kept confidential, and shall not be intentionally disclosed by Bidder to the third parties.

1.15. Withdrawal of Proposal

Bidder may withdraw its Proposal at any time before the Bid Closing Date. Withdrawal shall be made in writing, and shall be received by KARI before the Bid Closing Date.

1.16. Property of Proposal

All documents submitted in response to this RFP shall become the property of KARI and will be retained by KARI.

1.17. Expenses

Expenses incurred by Bidders in connection with the preparation, submittal, and any subsequent clarification or negotiation activities are for their own account and will not be reimbursed by KARI.

1.18. Governing Law

This RFP and the Contract shall be construed in accordance with and governed by the laws of the Republic of Korea.

1.19. Arbitration

Any disputes in relation to, and under the RFP and the Contract shall be resolved through arbitration in Seoul, Korea, under the Rules of the Korean Commercial Arbitration Board.

V. GENERAL TERMS AND CONDITION

Preamble

This Contract made on _____, 2015 by and between Korea Aerospace Research Institute ("KARI") established under the law of the Republic of Korea with its principal office at 169-84 Gwahak-ro, Yuseong-gu, Daejeon 34133 Korea, and _____ ("Contractor") established under the law of _____ with its principal office at _____.

Witnesseth

WHEREAS, KARI has a satellite assembly, integration and test center (hereinafter referred to as 'AITC') for the purpose of the effective development of domestic satellites;

WHEREAS, KARI acknowledged the necessity of design and installation of new large vibration system which is equipped with the large slip table with 3m interface in order to increase the vibration shaker capability and improve the accessibility to satellite for the safe environmental testing and KARI wants to procure large slip table system and related interface equipment;

WHEREAS, Contractor represents that it has direct knowledge and first-hand experience in developing, manufacturing and supplying the large vibration system which is equipped with the slip table with 3m interface;

WHEREAS, Contractor is willing to develop, supply and install the large vibration system to KARI.

NOW THEREFORE, in consideration of the premises and the mutual covenants hereinafter contained, KARI and Contractor have agreed as follows:

Article 1. Definition

In this Contract, the following words and phrases shall have the meanings as indicated below, unless the context wherein they are used clearly indicates another meaning:

- 1.1 **Associates** mean all individual or legal entities organized under public or private law, who shall act, directly or indirectly, on behalf of KARI or Contractor, or at the direction of either Party to this Contract to fulfill the obligations undertaken by such Party in this Contract, including, without limitation, the employees of each Party, their suppliers and Subcontractors.
- 1.2 **Auxiliary Equipment** means supporting equipment to operate and monitor the slip table system. It includes hydraulic group, drive bar for shaker interface and alignment device for bearing installation as minimum.
- 1.3 **AITC** means satellite assembly, integration and test center in KARI.
- 1.4 **Contract** means this Contract for the development of the Large Slip Table System for Large Vibration Test Facilities, including Appendices as attached hereto, and all amendments that may be subsequently agreed to by the Parties in accordance with the terms and conditions of this Contract.
- 1.5 **Contractor** means_____.
- 1.6 **Contract Price** means the amount of Contract. If there is any change in Contract Price due to any reason, then the Contract Price means current total amount of Contract.
- 1.7 **Deliverable Data** means any technical data as enlisted in Appendix B-1 "Statement of Works" that Contractor shall deliver to KARI and any related data thereof under this Contract.
- 1.8 **Deliverable (Delivery) Item(s)** means Large Slip Table System, Deliverable Data, and information as enlisted in Appendix B-1 "Statement of Works" that Contractor shall deliver to KARI.
- 1.9 **EDC** means the Effective Date of this Contract.

- 1.10 **Event(s) of Force Majeure** means any act of God, war, whether or not declared, act or failure to act of any government in its sovereign capacity, fire, earthquake, flood, epidemic, quarantine, nuclear incident, or any other act beyond the reasonable control and without the fault of either Party or its Subcontractors.
- 1.11 **Factory Acceptance** means KARI's pre-shipment inspection or audit including the testing activities for Deliverable Item at Contractor's facility.
- 1.12 **KARI** means Korea Aerospace Research Institute.
- 1.13 **Large Slip Table** means the moving part of the slip table system and mechanical interface. It includes the slip plate, T-film bearings & installation structure, stiffness structure, small slip table & cleanliness cover as minimum.
- 1.14 **Large Slip Table System** means the system that consists of Large Slip Table and Auxiliary Equipment that Contractor shall deliver and install to KARI site.
- 1.15 **Party or Parties** means KARI or Contractor, or both, according to the context.
- 1.16 **Site Acceptance** means final acceptance by KARI of the Deliverable Item at KARI site in accordance with Article 13 "Site Acceptance and Inspection".
- 1.17 **Subcontract** means any subcontract, including purchase orders and all similar forms of agreements at any tier under this Contract.
- 1.18 **Subcontractor** means a contractor under any Subcontract including suppliers and vendor.
- 1.19 **Third Party(ies)** means any individual or legal entity other than the Associates and the Parties.
- 1.20 **Work(s)** means whole or any part of the work, but not limited to review meeting, delivery, installation, test, training, warranty and maintenance, to be executed by a Contractor in accordance with this Contract.

Article 2. Objective

- 2.1 The objective of this Contract is to procure the qualified Large Slip Table System for Large Vibration Test Facility through the effort of the Contractor. To accomplish this objective, Contractor shall perform all the Works under this Contract required for design, manufacture, qualification, test, installation, training, warranty and maintenance as well as the delivery of Deliverable Item to meet the requirements and specification of this Contract.

Article 3. Contract Documents

- 3.1 This Contract shall comprise the following documents, as amended from time to time by written agreement by and between both Parties:

[A] Terms and Conditions

[B] Appendices

B-1. Statement of Works

B-2. TBD

B-3. TBD

B-4. TBD

- 3.2 In the event of any inconsistency or discrepancy between or among the Contract documents as listed in Article 3.1 above, the Contract documents shall be applied in the decreasing order of precedence.
- 3.3 In the event of any dispute or difference between the Parties in the interpretation of this Contract as a result of the application of the Appendices as specified in Article 3.1, Contractor's Proposal dated _____ submitted to KARI in anticipation of this Contract in response to KARI's Request for Proposal dated _____ shall be used as a reference document to identify and clarify the intention and understanding of the Parties as contemplated in this Contract, and both Parties shall in good faith seek an agreement or a compromise acceptable to both Parties without modification or amendment to this Contract.

Article 4. Responsibilities of the Parties

4.1 Responsibilities of KARI

- 4.1.1 KARI shall make a payment to Contractor in accordance with Article 6 “Terms of Payment”.
- 4.1.2 In accordance with Appendix B-1 “Statement of Works”, KARI shall provide any reasonable support including facilities, equipment and information in order for Contractor to fulfill the installation of Large Slip Table System at KARI site.
- 4.1.3 KARI shall provide reasonable cooperation and support in order for Contractor to obtain any government approval.

4.2 Responsibilities of Contractor

- 4.2.1 Contractor shall have all responsibilities for the development and delivery of Large Slip Table System to KARI in a timely manner as required and defined under this Contract without any charges to KARI.
- 4.2.2 Contractor shall provide all Work including the installation, training, warranty and maintenance and technical support required and stated under this Contract to KARI.
- 4.2.3 Contractor shall obtain any government approval including the export license to provide KARI with the Large Slip Table System.

Article 5. Contract Price

- 5.1 For the full, satisfactory and timely performance of the Work by the Contractor in accordance with the provisions of the Contract, KARI hereby agrees to pay to the Contractor _____ Euros/USD (TBD), in accordance with the terms of payment as stipulated in Article 6 “Terms of Payment”.
- 5.2 The Contract Price as specified in Article 5.1 above shall be firm and fixed price that is not subject to any escalation or to any adjustment or revision by reason of

the increase of actual costs incurred by Contractor in the performance of the Work under this Contract, unless otherwise agreed to by both Parties under Article 21 “Changes”.

- 5.3 The Contract Price as specified in Article 5.1 above shall be comprised of the following items.

Items	Qty	Price (€/USD)
Total		

- 5.4 All banking charges incurred in Korea shall be borne by KARI and those charges incurred outside Korea shall be borne by Contractor.

Article 6. Terms of Payment

6.1 Payment Schedule

- 6.1.1 Payment shall be executed after the establishment of performance bond in accordance with Article 7 “Performance Bond”.

- 6.1.2 KARI shall pay to Contractor the Contract Price as stipulated in Article 5.1 in accordance with the following schedule:

No.	Payment milestone (in Month)	Payment due date	Payment (USD/€)	Percentage of Contract Price (%)
1	EDC	EDC+ 1M		
2	DR (EDC+ M)	EDC+ M		
3	TRR (EDC+ M)	EDC+ M		
4	FAR (EDC+ M)	EDC+ M		
5	SAR (EDC+ M)	EDC+ M		
Total				100 %

- * “EDC” means the Effective Date of this Contract in accordance with Article 23.1 “Effective Date of Contract”.
- * “DR” means the Design Review.
- * “TRR” means the Test Readiness Review at Contractor site.

- * "FAR" means the Factory Acceptance Review at Contractor site.
- * "SAR" means the Site Acceptance Review at KARI site.

6.2 Billing Procedure

6.2.1 All invoices Contractor submits for payment shall be in duplicate signed by an authorized company official and received by KARI at least thirty (30) days before the payment due dates as specified in Article 6.1.

6.2.2 All payments shall be made in US dollars/Euros by telegraphic transfer to the bank account as designated by Contractor in its invoices. And KARI shall remit the payment within thirty (30) days after KARI's receipt of Contractor's invoice.

6.3 Suspension of Payment

6.3.1 Notwithstanding any provisions of this Contract, if any payment milestone as set forth in Article 6.1.2 has not been accomplished for any reasons attributable to Contractor, KARI may, with an advance notice, suspend such payment due until both Parties agree that the delayed payment milestone has been accomplished.

6.3.2 In the event of KARI's suspension of payment under Article 6.3, Contractor shall nevertheless continue to perform its obligations under this Contract regardless of whether KARI is entitled to suspend the payment.

6.4 Deduction of Payment

6.4.1 All losses, costs, charges, damages and expenses which KARI incurs or sustains by reason of any act, default or omission of the Contractor in the performance of the Contract and any other amounts which KARI is entitled to receive from the Contractor may be deducted from any payment that may be or become due to the Contractor from KARI.

6.4.2 A prior written notice given by KARI accompanied with documents stating the amount due to KARI referred to in Article 6.4.1 and the reason of deduction shall be prima facie evidence of the matters stated herein.

Article 7. Performance Bond

- 7.1 Contractor shall establish a performance bond within three (3) weeks after EDC in favor of KARI in the value of ten percent (10 %) of the Contract Price, in the form of an irrevocable and unconditional standby letter of credit available by KARI's draft at sight.
- 7.2 The entire amount covered by the performance bond shall be payable to KARI on demand together with KARI's written statement to the effect:
- (a) that there was a default of the Contractor in the performance of the Contract (including Subcontractor's default under the Subcontract), or
 - (b) that any amount KARI is entitled to receive from Contractor has not been paid by Contractor to KARI through any other means, or
 - (c) that this Contract was terminated by Contractor's breach as specified in Article 19.2.

Whenever any amount has been withdrawn by KARI due to such cases of (a) and (b) as above, performance bond shall be replenished.

- 7.3 The letter of credit shall be issued by first class international bank acceptable to KARI. The letter of credit shall be drawn in favor of KARI and advised through the Woori Bank (Daejeon Branch at 29 Munye-ro, Seo-gu, Daejeon, 35241 Korea, Tel: +82-42-488-9704, (Ext. 312)/ Fax: +82-505-003-0759) and shall remain valid until the end of warranty expiration. The letter of credit shall not be amended, modified or canceled without KARI's prior written consent.
- 7.4 It is hereby agreed between the Parties that payment from the Performance Bond under this Article 7 shall not affect any other KARI's rights, privileges, interests or remedies under this Contract or the applicable law.

Article 8. Deliveries

- 8.1 General
- 8.1.1 Contractor shall deliver Deliverable Item in accordance with the defined schedule and method as set forth in Appendix B-1 "Statement of Works" and the delivery shall be deemed to have occurred only when the Site Acceptance has been

successfully completed at KARI site.

- 8.1.2 Contractor shall bear any charges or costs of whatsoever nature that are incurred in relation to such delivery or provision until such delivery or provision is duly made under this Contract without any non-conformity and accepted in accordance with Article 13 "Site Acceptance and Inspection" hereof, and shall keep KARI free from any such charges and costs.
- 8.1.3 Contractor agrees that delivery or provision of time and place under this Contract, whether specifically provided for or not, or in subsequent amendments thereto, are of the essence of this Contract.
- 8.1.4 Contractor shall be responsible for all applicable taxes imposed outside Korea including any customs duties and charges of any nature levied on Deliverable Item, spare parts, spare materials, tools, consumables and ancillary equipment as well as any charges associated with the transportation.
- 8.2 Delivery to KARI
- 8.2.1 Contractor shall deliver Deliverable Item under the rule of DAP (Delivery At Place in accordance with the Incoterms 2010) KARI in accordance with the delivery schedule of this Contract.
- 8.2.2 To obtain import certification, Contractor shall notify KARI by e-mail (address is "acoust@kari.re.kr" for Mr. Jong-Min IM and "jncho@kari.re.kr" for Mr. Jung-Nam CHO) fourteen (14) calendar days prior to each shipment with one set of proforma invoice and packing list specifying the number of boxes, name of Items, unit price, and size and volume of each container or box to be shipped. As soon as each shipment as provided for in this Article is made, Contractor shall send one (1) copy of the following shipping documents to KARI by e-mail;
- (a) Clean on board vessel bill of lading/or airway bill of lading,
 - (b) Commercial invoice,
 - (c) Packing list,
 - (d) Weight and measurement list,
 - (e) Manufacturer's Inspection Report,
 - (f) Certificate of Origin, and
 - (g) Export License (if possible).

Article 9. Delay

9.1 Excusable Delay

9.1.1 Neither Party shall be responsible to the other Party for any delay in performing its obligations under this Contract due to any Events of Force Majeure.

9.1.2 The Party whose performance of obligations hereunder has been affected by any Events of Force Majeure shall notify the other Party within ten (10) days thereafter by sending a detailed statement and sufficient evidence with respect thereto, and promptly of any subsequent change in the circumstances, if any. The affected Party shall exercise its best efforts under the circumstances to remove or remedy the Events of Force Majeure and the effects thereof and resume full performance hereof as soon as possible.

9.1.3 Notwithstanding Article 9.1.1 hereof, any such delay that has not been notified to the other Party or any delay of performance of the affected Party falling due after delay, failure or incompleteness in exercising the pertinent best efforts to remove or remedy the pertinent Events of Force Majeure or the effects thereof pursuant to Article 9.1.2 hereof shall not be excused for any reason whatsoever.

9.1.4 The Party who has received or is entitled to duly receive the notice of Events of Force Majeure under Article 9.1.2 hereof may suspend performance of its obligations which shall be due subsequent to such Events of Force Majeure, until the other Party has effected such delayed performance to the full extent after and in view of such Events of Force Majeure.

9.2 Non-Excusable Delay

9.2.1 In the event that, unless otherwise excused by virtue of this Contract, any reason attributable to KARI or the governing or applicable law, Contactor delays the provision or delivery of Deliverable Items as stipulated under this Contract, Contractor shall pay for damages as defined in the Article 9.2.2 to KARI as a result of such delay.

9.2.2 Contractor acknowledges and agrees that the timely provision or delivery of the Deliverable Item as stipulated under this Contract or its performance of other

obligations under this Contract is essential to KARI, and that such delay as provided for in Article 9.2.1 hereof may cause substantial financial loss or damage to KARI's rights, interests, privileges and benefits, which may not be assessable or recoverable. Both Parties therefore specifically agree that in the event of such loss or damage caused by delay attributable to Contractor, its Subcontractor or any of its agents, Contractor shall pay KARI as liquidated damages zero point one five percent (0.15%) of Contract Price per day of such delay. In no case, however, shall the aggregated liquidated damages exceed ten percent (10%) of Contract Price. It is also agreed by both Parties that KARI shall be entitled to terminate this Contract for Contractor's breach, only if the aggregated liquidated damages under this Article, excluding those days of delay excused by KARI in writing, exceeds ten percent (10%) of the Contract Price.

- 9.2.3 This Article shall not affect other remedies, rights, privileges, interests, benefits of KARI under this Contract or the governing or applicable law. Contractor agrees that any right of KARI under this Article is not an alternative or substitute to other remedies, rights, privileges, or interests of KARI, and that Contractor's correction of such defect or non-conformity under this Article does not relieve Contractor from any liability to KARI which may arise under this Contract of the governing or applicable law as a result of such defect or non-conformity.
- 9.2.4 For the purpose of this Article, any action or omission of Contractor's Subcontractor, agent, or servant, de facto or de jure, shall be deemed to be Contractor's own.

Article 10. Taxes and Duties

- 10.1 In the event taxes are charged in Korea, KARI shall be fully responsible for payment of such taxes. Contractor shall be fully responsible for the payment of all applicable taxes imposed outside Korea including any customs duties and charges.
- 10.2 Neither Party shall be responsible for paying the customs duties, and related taxes, fees, or charges for the personnel and the personal belongings of the other Party.
- 10.3 The Contractor shall further comply with instructions KARI may issue from time to time in order to facilitate any exemptions or reductions from customs duties and

other taxes that might be levied on KARI and shall impose the same obligations on its Subcontractors.

Article 11. Intellectual Property

- 11.1 KARI shall own and have a right to use, without any obligation, all the Deliverable Items provided by Contractor in its performing this Contract. Contractor shall take all necessary precautions so that all the Deliverable Items supplied hereunder shall be free from infringement of any patent, design patent, trademark, utility model or any other industrial property right, copyright, license or any other right thereunder of any Third Party.
- 11.2 In the event that any Party other than Contractor claims or threatens to claim infringement by KARI with respect to such use of the Deliverable Items, Contractor shall defend, hold harmless, and indemnify KARI from such infringement claims.
- 11.3 This Article will survive the completion of the Contract, any termination, cancellation or expiration of the Contract in any manner whatsoever.

Article 12. Factory Acceptance

- 12.1 The Factory Acceptance of Large Slip Table System shall occur only after:
- (a) all specified tests to be performed by the Contractor under the Contract for the Large Slip Table System have been completed in accordance with the Contract; and
 - (b) the Contractor has demonstrated to KARI that the Large Slip Table System meet the specifications and requirements in this Contract; and
 - (c) all Works and conditions under the Contract to be fulfilled by the Contractor prior to the shipment of Large Slip Table System have been met,

in which case KARI shall accept, in writing, the Large Slip Table System subject to the provisions set forth below.

- 12.2 Subject to the conditions as set forth in Article 12.1 above, a Factory Acceptance

of Large Slip Table System shall be occurred only when the FAR (Final Acceptance Review) has successfully completed at Contractor site in accordance with Appendix B-1 "Statement of Works". After the FAR, KARI's authorized representative shall notify the result of FAR in writing. If KARI determines that Large Slip Table System is unacceptable, it shall notify the Contractor, in writing, the reasons therefore.

- 12.3 If Large Slip Table System is determined to be unacceptable, Contractor shall, at its expense, promptly repair or replace Large Slip Table System so that it shall comply with the Contract specifications and requirements, and Contractor shall hold the additional FAR of such repaired or replaced Large Slip Table System for KARI's confirmation. The Contractor shall present to KARI the root cause and the result of such repair or replacement on the additional FAR. Such repaired or replaced Large Slip Table System shall be accepted in accordance with the requirements of Article 12.1.
- 12.4 For the FAR, KARI, at all times during the performance of this Contract, shall have the right to do the following activities at the Contractor's facilities or other relevant facilities under this Contract;
- (a) Access the Items, testing activities and data, related to, used for, prepared or generated in connection with this Contract, and
 - (b) Witness all qualification and acceptance testing of the Deliverable Items to be delivered or provided under this Contract including all tests used for the purpose of demonstrating qualification.
- 12.5 Contractor shall make such data and documentation, equipment and facilities available to KARI upon KARI's request and KARI's selection for such purposes. Contractor shall deliver copies of design and test data and other technical data, excluding financial data, required to evaluate technical problems or non-performance that may occur during the performance of this Contract. Such documentation and data shall also be available for KARI to make copies thereof.

Article 13. Inspection and Site Acceptance

- 13.1 Notwithstanding the successful FAR, KARI shall carry out incoming inspection of

the Deliverable Item after delivery within one (1) week after delivery. In the event that KARI discovers that any Deliverable Item provided or delivered pursuant to Article 8 "Deliveries" are defective or non-conformity during the incoming inspection, KARI shall promptly notify Contractor thereof and provided that such defect or non-conformity is not attributable to KARI, Contractor shall promptly remedy such defect or non-conformity and retest. In addition, if remedying such defect or non-conformity would substantially delay as compared to the period required to complete such substitution, Contractor shall promptly provide substitute Items. Upon the remedy of such defect or non-conformity that the requirements of this Contract are satisfied in all respects or upon the provision of substitute Items, Contractor shall notify KARI of the details of the remedy undertaken by Contractor.

13.2 The Site Acceptance of Large Slip Table System shall occur only after:

- (a) the Contractor shall successfully install the Large Slip Table System at Large Vibration Test Facilities in KARI;
- (b) the performance of the Large Slip Table System after such installation under the Contract shall meet the specifications and requirements in this Contract; and
- (c) all Works and conditions under the Contract to be fulfilled by the Contractor prior to SAR (Site Acceptance Review) have been met,

in which case KARI shall finally accept, in writing, the Large Slip Table System subject to the provisions set forth below.

13.3 Subject to the conditions as set forth in Article 13.1 above, a Site Acceptance of Large Slip Table System shall be occurred only when the SAR has successfully completed at KARI site in accordance with Appendix B-1 "Statement of Works". After the SAR, KARI's authorized representative shall notify the result of SAR in writing. If KARI determines that Large Slip Table System is unacceptable, it shall notify the Contractor, in writing, the reasons therefore. If such written Site Acceptance letter is not given to Contractor, within thirty (30) days after the SAR of Deliverable Item, the Deliverable Item shall be deemed to have been accepted by KARI.

13.4 If Large Slip Table System is determined to be unacceptable, both Parties shall

jointly investigate the root cause and if the root cause is attributable to the Deliverable Item, then it shall be considered as non-delivery and Contractor shall, at its expense, promptly repair or replace Large Slip Table System so that it shall comply with the Contract specifications and requirements. Such repaired or replaced Item shall be accepted in accordance with the requirements of Article 13.1 and 13.2.

- 13.5 The Parties agree that the acceptance of the Deliverable Item under this Article shall not be interpreted or construed to mean that such Item is free of all defects and conform in all respects with the requirements of this Contract, and Contractor shall not be entitled to any additional costs incurred or to recover any damages suffered due to defects in the Item or KARI's rejection of the Item.

Article 14. Spare Parts and Erection Tools

- 14.1 Contractor shall provide KARI with all list and delivery time of spare parts/erection tools for KARI's use for consumable and five (5) years of operation as per the Scope of supplies specified in Contract Specifications.
- 14.2 Contractor shall guarantee that spare parts/erection tools can be made available for fifteen (15) years.

Article 15. Indemnification

- 15.1 Contractor shall indemnify and hold KARI, its officers, agents, servants, employees, subsidiaries, successors, and assignees, or any of them, harmless from any and all loss, damage, liability or expense resulting from damage to all tangible property and injuries including death, to all persons, in the circumstances caused by its act or omission in the performance of the Work, and shall pay all expenses, including reasonable attorneys' fees, and satisfy all judgments as may be incurred by or rendered against them, or any of them.

Article 16. Licenses, Clearances and Permits

- 16.1 Unless otherwise specified in this Contract, each Party is responsible for obtaining all government approvals from any government authority which has jurisdiction and authority to require such approvals, including, but not limited to, licenses, visas, and permits necessary to carry out such Party's obligations in accordance with this Contract. KARI is responsible for obtaining any necessary Korean government approvals, and Contractor is responsible for all other government approvals.
- 16.2 The Parties shall cooperate and provide each other, upon request of and without cost to the other Party, all reasonable and necessary assistance in obtaining any and all governmental approvals, which they respectively are required to obtain pursuant to this Contract.
- 16.3 Each Party shall be solely responsible for any expenses incurred in obtaining the approvals, which are required under this Article. The Parties shall provide to each other, upon request of and without cost to the other Party, suitable documents or other reasonable evidence to show that they have obtained any and all governmental approvals, which they respectively are required to obtain pursuant to this Contract.

Article 17. Confidentiality

- 17.1 Each Party shall confidentially treat all documents, data, materials and information supplied by one to the other, and shall not disclose the above to any Third Party, and shall not use the above for any other purpose than for the performance of this Contract without prior written consent from the other Party. However, this Confidentiality obligation shall not be apply to the information which is made available to the general public.

Article 18. Warranty

- 18.1 Any patent, utility, design, copyright, technical know-how and any other type of intellectual property used by Contractor, its Subcontractors, servants, or agents, or delivered or provided to KARI directly or indirectly in connection with this Contract shall be free of any infringement actions by any Third Party claiming its

rights or interests with regard thereto in disposing with in accordance with this Contract.

- 18.2 The Deliverable Item and its installation supplied and performed by Contractor or its Subcontractors hereunder shall be in good working order and free from all defects in workmanship and materials and shall comply with the requirements of this Contract. Warranty period for the Deliverable Item shall be one (1) year from successful Site Acceptance Review.
- 18.3 Upon the receipt of written notification from KARI that the Deliverable Item delivered by Contractor or its Subcontractors is defective or non-confirming, the Contractor shall repair or replace, at Contractor's option and its own expense, such Deliverable Item so as to comply with the above warranties.
- 18.4 The Contractor shall not be entitled to any additional costs (for instance, the cost for the repair or replacement of faulty parts at its option, the labor cost required for repair, traveling cost, per diem and all associated necessary costs) incurred or to recover any damages suffered due to defect in the Deliverable Item or rejection of the Deliverable Item by KARI.
- 18.5 Contractor shall submit the written plan for repair within forty eight (48) hours after the reception of KARI's notification of fault and shall completely finish the repair within thirty (30) days after the receipt of KARI's written notification of fault.
- 18.6 For an urgent service during any important test period using the Large Table System, The remedy of warranty is five (5) days from the receipt of KARI's written notification of service. To meet the deadline of the urgent service, KARI will notify Contractor of the test start date and the period two (2) weeks prior to the test start date. Contractor shall stand by the A/S crews at Contractor's convenient place during the test period (up to four (4) weeks). Contractor shall include a plan for these requirements.
- 18.7 Both Parties acknowledge that the breach of a warranty may result in serious damages to KARI's right, interests, privileges, and benefits, de facto or de jure, or loss of KARI's profits. If a breach of warranty has not been cured within thirty (30) days from the date of KARI's written notification to Contractor of such breach, Contractor shall pay all the damages to KARI due to the breach of any warranty.

- 18.8 The right and remedies provided under this Article 18 are in addition to any other rights or remedies available to KARI under the Contract or applicable laws.

Article 19. Termination

19.1 Termination for Events of Force Majeure

- 19.1.1 In the event that the excusable delay under Article 9 “Delay” exceeds three (3) months for any single Events of Force Majeure or six (6) months in the aggregate for all Events of Force Majeure, KARI, at its sole discretion, may declare frustration of this Contract, and terminate the whole or any part of this Contract by sending a three (3) days prior notice to the Contractor.

- 19.1.2 In the event this Contract is terminated by Article 19.1.1 above, each Party shall effect the restitution to the other Party of whatever is provided, delivered, or paid to it in the same manner and types as such provision, delivery or payment was made.

19.2 Termination for Breach

- 19.2.1 KARI may, by written notice to the Contractor, terminate the whole or any part of the Contract, if any of the following circumstances occurs;

- (a) Contractor fails to deliver any Deliverable Item under Contract in accordance with the delivery schedule; or
- (b) Contractor fails to perform any Work under this Contract or fails to progress with the Work in a manner which satisfies KARI that Contractor will perform the Contract within the time specified and in accordance with the terms of the Contract; or
- (c) Contractor fails to remedy any or all defects and non-conformity on the Deliverable Item in accordance with Article 13.

- 19.2.2 In the event of the circumstances in Article 19.2.1, KARI may notify the Contractor and may suspend any further performance of its obligation under this Contract. If the Contractor fails, within ten (10) days from the dispatch of the notice, to produce and notify KARI of reasonable evidence of its intent and ability to effect

due performance of the obligation in breach within thirty (30) days from due dispatch of written notice, then KARI may terminate this Contract with three (3) days' prior notice of termination.

- 19.2.3 In the event this Contract is terminated for Contractor's breach, the Contractor shall return all the amounts paid by KARI under the Contract and also pay the termination charge of ten percent (10%) of the total Contract Price. KARI shall return the Deliverable Item to Contractor, if any.

19.3 Termination for Special Circumstances

- 19.3.1 Either Party may terminate this Contract anytime upon or after due dispatch of notice of such effect, without any other conditions, in the event that the other Party falls within any of the following categories:

- (a) the other Party has fallen bankrupt or insolvent;
- (b) the other Party passed a resolution for its reorganization (bankruptcy related), dissolution, liquidation or winding-up; or
- (c) a court order for proceedings for the bankruptcy, reorganization (bankruptcy related), dissolution or winding-up of the other Party has been applied for by any person and such application has not been dismissed within sixty (60) days.

- 19.3.2 In the event this Contract is terminated by Article 19.3.1 above, each Party shall effect the restitution to the other Party of whatever is provided, delivered, or paid to it in the same manner and types as such provision, delivery or payment was made.

19.4 Termination for Convenience

- 19.4.1 KARI may terminate this Contract, in whole or in part, for its convenience, with thirty (30) days' prior written notice to Contractor. In case of such termination for convenience, Contractor is entitled to receive payment due which Contractor has already done in accordance with Article 6.1.2 within thirty (30) days from the date of termination and KARI shall release performance bond at the same time.

Article 20. Resolution of Disputes and Governing Law

- 20.1 In cases any controversy or claim arises out of or in relation to this Contract or with respect to a breach hereof, the Parties shall seek to resolve the matter amicably through discussions between themselves. In the event of any disagreement between KARI and Contractor about the interpretation of the provisions or definitions used in this Contract, the interpretation of KARI shall govern until and unless otherwise decided by arbitration conducted pursuant to the following provisions.
- 20.2 If the Parties cannot resolve such controversy or claim in accordance with Article 20.1 above, it shall be finally settled by arbitration in Seoul, Korea, before the Korean Commercial Arbitration Board in accordance with its rules. The proceedings shall be conducted in English. The award rendered by the board shall be final and binding on the Parties and may be entered in any court of competent jurisdiction for execution.
- 20.3 The validity, performance, construction, and effect of this Contract shall be governed by the laws of Korea.

Article 21. Changes

- 21.1 Changes Requested by KARI
- 21.1.1 Any changes requested by KARI during the performance of this Contract, within the general scope of this Contract, which would add or delete Work, affect the design of Work, change the method of shipment or packing, place or time of delivery, duration of Contract, or would affect any other requirement of this Contract, shall be submitted in writing to Contractor. Contractor shall respond to any changes KARI requested in writing within thirty (30) days after receipt of such request. If such change requested by KARI causes an increase or decrease in the Contract Price and/or an impact of schedule, Contractor shall submit to KARI at the time the response to the requested change is submitted, the details of such increase or decrease.
- 21.1.2 KARI shall notify Contractor in writing, within thirty (30) days after receipt of Contractor's response, whether it agrees with and accepts Contractor's response.

If KARI agrees with and accepts Contractor's response, an amendment to the Contract reflecting such change, Contract Price and/or schedule adjustment, if any, shall be issued, and Contractor shall proceed with the performance of the Contract as changed. Contractor shall provide updated information that reflects the final agreed price of the change, if KARI requests. In the event the Parties are unable to agree on a change requested by KARI or price adjustment, if any, or both, Contractor shall proceed with the performance of the Contract as unchanged.

21.2 Changes Requested by Contractor

21.2.1 Any changes requested by Contractor during the performance of this Contract, within the general scope of this Contract, that would add or delete Work, affect the design of Work, change the method of shipment or packing, place or time of delivery, duration of Contract, or would affect any other requirement of this Contract, shall be submitted in writing to KARI thirty (30) days prior to the proposed date of the change. If such change requested by Contractor causes an increase or decrease in the Contract Price, Contractor shall submit to KARI at the time the requested change is submitted, the details of such increase or decrease.

21.2.2 KARI shall notify Contractor in writing within thirty (30) days after receipt of the requested change and Contract Price adjustment, if any, whether or not it agrees with and accepts such change. If KARI agrees with and accepts change requested by Contractor, an amendment to the Contract reflecting such change, and Contract Price adjustment, if any, shall be issued, and Contractor shall proceed with the performance of the Contract as changed. Contractor shall provide updated information which reflects the final agreed price of the change, if KARI requests. In the event the Parties are unable to reach an agreement on a change requested by Contractor, or Contract Price adjustment, if any, or both, Contractor shall proceed with the performance of the Contract as unchanged.

Article 22. Notices

22.1 All notices, requests, demands, approvals, reports, invoices, and other correspondence to be provided pursuant to this Contract shall be in writing and shall be deemed to have been duly given to the Party to be notified: (i) on the

date of delivery if delivered in person, (ii) on the date of dispatch if by facsimile, telex or e-mail, or (iii) on the date of receipt if by registered airmail or overnight courier.

All notices shall be addressed to the appropriate Party at its address as follows:

For KARI: **Korea Aerospace Research Institute**

169-84 Gwahakro, Yuseong-gu, Daejeon 34133, Korea

Commercial matters

Mr. Jung-Nam CHO

Tel: +82-42-860-2613

Fax: +82-42-860-2666

E-mail: jncho@kari.re.kr

Technical matters

Mr. Jong-Min IM

Tel: +82-42-860-2562

Fax: +82-42-860-2234

E-mail: acoust@kari.re.kr

For Contractor: **[Company]**

[Address]

Commercial matters

Technical matters

[Name]

Tel: +

Fax: +

E-mail:

[Name]

Tel: +

Fax: +

E-mail:

- 22.2 Each Party may change its address for notice by notice given to the other Party in the manner set forth above. And any notices given as provided herein shall be considered effective seven (7) days after the registered postage pre-paid airmailing thereof or the day of actual receipt thereof, whichever occurs first, or on the day of personal delivery, or the day of sending if by facsimile, telex or e-mail.

Article 23. Miscellaneous

23.1 Effective Date of the Contract

The effective date of this Contract ("EDC") is the date on which the duly authorized representatives of both Parties have signed this Contract, and any amendment to

this Contract shall be effective only upon signature by the authorized representatives of both Parties.

23.2 Entire Agreement

This Contract embodies the entire agreements of the Parties with respect to the subject matter hereof and supersedes and cancels any and all prior understandings or agreements, oral or written, in relation hereto, which may exist between the Parties. No oral explanation or oral information by any of the Parties shall alter the meaning or interpretation of this Contract.

23.3 Assignability

This Contract and each and every covenant, term and condition hereof shall be binding upon and inure to the benefit of the Parties and their respective successors, and neither this Contract nor any rights and obligations hereunder shall be assignable or delegable directly or indirectly by either Party without the prior written consent of the other Party.

23.4 Unenforceable Terms

If any term or provision of this Contract shall for any reason be invalid, illegal or unenforceable in any respect, this Contract shall be interpreted and construed as if such term or provision had never been included herein.

23.5 Non-waiver

The failure or delay of any Party to require performance by the other Party of any provision of, or of any right or obligation under this Contract, shall not constitute a waiver thereof, nor shall such affect that Party's right to thereafter require performance of such or any other provision, right or obligation.

23.6 Disclaimer of Agency

This Contract shall not be deemed to constitute any Party to become the agent of the other Party.

23.7 Headings

The headings in this Contract have been inserted for convenience of reference only and are not to be used in consulting or interpreting this Contract.

23.8 Language and Unit

All documents, drawings, plans and other writings as well as communications between both Parties under this Contract shall be in English and measurements and quantities for Deliverable Data shall be recorded in units of *Système Internationale*.

23.9 Time Limits

Unless otherwise indicated, any time limits to which this Contract binds Contractor or KARI shall be counted in calendar days from the day following that of the event marking the start of the time limit, and shall end on the last day of the period specified. When the last day of a time limit is a Saturday or Sunday, or a legal holiday in the country in which the particular contractual performance is required, such time limit shall be extended to the first working day following.

23.10 Subcontractors

Each Party shall be fully responsible for the work of its Subcontractors under this Contract, and such subcontracting shall not relieve that Party of its obligation under this Contract.