Marshall Space Flight Center
Engineering, Science & Technical Services

JACOBS ESTS Group

Task Order Plan (TOP)

Contract Number: *NNM05AB50C*
TO Title: *CLV Engineering Test Support*
TO Number: *36-010001* **Revision:** *17*

Period of Performance: *10/03/2009* to *09/30/2011*

MSFC Initiator: *Michael Mims*

(b)(4)

Emergency: *No*

Revision 17: The purpose of this revision is to extend this task into Contract Year 6 of the NNM05AB50C ESTS contract. This revision defines and estimates work for the period 2 October 2010 through 30 September 2011. Additionally the Schedule, Performance Plan, and Risk Assessment have been revised to reflect any changes in task activities for the new period of performance. This revision also closes Subelement 02 and combines it with Subelement 01.

Task Order revision history:
Revision 16: increased scope for the Lunar Lander Engine Test Bed that included (b)(4 labor hours for Subelement 02 (b)(4) instrumentation/control engineering test support, WBS 253225.04.04.50.0. Subelements CG, CH, CI, CJ, and CK were administratively closed.
Revision 15, effective 4/26/2010 continued the work from task 36-000104, which was closed, to combine Task Orders, included (b)(hours for Subelement 00, Task Order documentation and (b)(labor hours for Subelement 01, non CLV instrumentation/control engineering for test support.
Revision 14, effective 1/29/2010 added (b)(4) labor hours for Subelement CJ ASMAT- Ares Scale Model Acoustic IOP test support.
Revision 13, effective 11/18/2009 extend task into Contract Year 5, deleted Subelement CA and changed MSFC Imitator to Michael Mims.
Revision 12, effective 8/18/09, added (b)(4 labor hours needed to support Subelement CI, LOX Damper Cryo Test and reduced the labor hours by (b)(to reflect the actual manpower needed to support Subelement CF, LOX Seal Bearing Test.
Revision 11, effective 7/20/09, added (b)(4) labor hour needed to support Subelement CG and (b)(4) labor hours needed to support Subelement CH.
Revision 10, effective 5/16/2009 added (b)(4) labor hours needed to support Subelement CF and added (b)(4) travel needed to support Subelement CA.
Revision 09, effective 4/17/2009 removed (b)(4) labor hours and removed (b)(4) (b)(4) needed to support Subelement CA.
Revision 08, effective 1/7/2009 added (b)(4) labor hours needed to support Subelement CA.
Revision 07, effective 10/4/2008 Closed Subelements CB, CC, CD, CE and extended the period of performance into Contract Year 4.
Revision 06, effective 8/14/2008 reduced (b)(4) labor hours needed to support Subelement CF.
Revision 05, effective 7/24/08 added travel resources to Subelement CD, reduce resources for subelements CA, CB and CF by (b)(4) hours and updated certification/training requirements.
Revision 04, effective 4/15/2008 added resources to support Subelement CB, CD, CF, corrected WBS numbers for Subelement CC and CD and added material for subelements CA and CD.

Revision 03, effective 1/14/08 added resources to support Small Solids Testing.
Revision 02, effective 9/29/07 extended the period of performance into Contract Year 3.
Revision 01, effective 8/2/07 added travel resources, reallocated and added labor resources.
Revision 00, effective 3/30/07 added labor resources to support CLV engineering test support for the Propulsion Test Branch.

1.0 Task Order Description & Objectives

Subelement CA and CF were closed by Revision 13.

Subelements CB, CC, CD and CE were closed in Revision 07.

Subelement CG will be administratively closed.
Subelement CG is assigned to Engineering Test Support for SD19 Common Bulkhead Test (WBS 136905.08.05.10.03.08.19). Primary support will include, but not be limited to, generation of measurement programs, measurement systems activation, control systems design, control systems activation and data review for the Common Bulkhead Test near Test Stand 500. Other duties will include data acquisition system technical support for the activation and end-to-end operation for testing activities, assisting with the activation and validation of data acquisition system for the Common Bulkhead Test, providing technical support to the planning, analysis and engineering of electrical/instrumentation/data acquisition/control systems (hardware and software).

Subelement CH was administratively closed.
Subelement CH is assigned to Engineering Test Support for General Ares Tasks. Primary support will include, but not be limited to, generation of measurement programs, measurement systems activation, control systems design, control systems activation and data review for general Ares Task.

Subelement CI was administratively closed.
Subelement CI is assigned to Engineering Test Support for LOX Damper Cryo Test (WBS 136905.02.04.08.08.17) Primary support will include, but not be limited to, generation of measurement programs, measurement systems activation, control systems design, control systems activation and data review for the LOX Damper Cryo Test at the East Test Area. Other duties will include data acquisition system technical support for the activation and end-to-end operation for testing activities, assisting with the activation and validation of data acquisition system for the LOX Damper Cryo Test, providing technical support to the planning, analysis and engineering of electrical/instrumentation/data acquisition/control systems (hardware and software).

Subelement CJ was administratively closed.
Subelement CJ is assigned to Engineering Test Support for the Ares I Scale Model Acoustic Test (ASMAT) Initial Over Pressure (IOP) (WBS 136905.10.60.30.10.10). Primary support will include, but not be limited to, generation of measurement programs, measurement systems activation, control systems design, control systems activation and data review for the ASMAT IOP at the East Test Area. Other duties will include data acquisition system technical support for the activation and end-to-end operation for testing activities, assisting with the activation and validation of data acquisition system for the ASMAT IOP, providing technical support to the planning, analysis and engineering of electrical/instrumentation/data acquisition/control systems (hardware and software).

Subelement CK was administratively closed.
Subelement CK is assigned to Engineering Test Support for the J2X Engine Augmented Spark Igniter (ASI) test support (WBS 136905.08.04.02.08.09.02). Primary support will include, but not be limited to, control systems design, control systems activation and data review for the J2X ASI test at the East Test Area. Other duties may include generation of measurement programs, measurement systems activation data acquisition system technical support for the activation and end-to-end operation for testing activities, assisting with the activation and validation of data acquisition system for the J2X ASI test, providing technical support to the planning, analysis and engineering of electrical/instrumentation/data acquisition/control systems (hardware and software).

The Task Order objective is to provide instrumentation/control engineering test support specific to CLV testing (PR 198036) for the above Subelements.

Subelement 00 is assigned to Task Order documentation and monthly status reports.

Subelement 01 is assigned to instrumentation/control engineering test support to the Propulsion Test Division of MSFC's Test Laboratory. This support will include, but not be limited to, generation of measurement programs, measurement systems activation, control systems design, control systems activation and data review for Test Stands 115/116/500 and the Solid Propulsion Test Article Test Stand. Other duties will include data acquisition system technical support for the activation and end-to-end operation for testing activities, assisting with the activation and validation of new stand-alone data acquisition systems for test cells/stands, providing technical support to the planning, analysis and engineering of electrical/instrumentation/data acquisition and control systems (hardware and software). Additional support may be provided to other test stands within the test complex as required. This Subelement is also assigned to the Lunar Lander Engine Test Bed instrumentation/control engineering test support to the Propulsion Test Division of MSFC's Test Laboratory (WBS 253225.04.04.50) . This support will include, but not be limited to, generation of measurement programs, measurement systems activation, control systems design, control systems activation and data review for Test Stand 500. Other duties will include data acquisition system technical support for the activation and end-to-end operation for testing activities, assisting with the activation and validation of new stand-alone data acquisition systems for test cells/stands, providing technical support to the planning, analysis and engineering of electrical/instrumentation/data acquisition and control systems (hardware and software).

This Subelement is closed by revision and combined with Subelement 01 by revision 17.
Subelement 02 is assigned to Lunar Lander Engine Test Bed instrumentation/control engineering test support to the Propulsion Test Division of MSFC's Test Laboratory (WBS 253225.04.04.50) . This support will include, but not be limited to, generation of measurement programs, measurement systems activation, control systems design, control systems activation and data review for Test Stand 500. Other duties will include data acquisition system technical support for the activation and end-to-end operation for testing activities, assisting with the activation and validation of new stand-alone data acquisition systems for test cells/stands, providing technical support to the planning, analysis and engineering of electrical/instrumentation/data acquisition and control systems (hardware and software).

2.0 Technical Approach (Including required input, guidelines & assumptions)

The following Technical approach items are common to all Subelements:

1. Review test facility drawings and specifications.
2. Review test requirements.
3. Coordinate with personnel in related tasks to resolve technical problems.
4. Perform checkouts, tests or experiments.
5. Review test implementation plans.
6. Develop and review facility activation and operation procedures.
7. Support anomaly resolution, as required.
8. Review test data.
9. Prepare work requests for ET10 to authorize measurement systems servicing, cleaning and installation of hardware for electrical/mechanical support systems.
10. Develop test measurements and or control systems implementation plans.

11. Develop procedures for activation and operation of the test facility measurement and control systems.
12. Support activation of the test facility measurement systems.

All equipment and facilities will be accessible to Jacobs ESTS Group /ESTS Group personnel. Any known documentation for the systems being evaluated will be made available by MFSC. It is assumed that MFSC will provide any/all required equipment to perform the work as required including a Computer, data review software, and an IDS account.

3.0 Discussion of Skills Required

Skill requirement is for (b)(4) electrical engineers having experience in electrical/instrumentation/data acquisition systems. Personnel experienced with electrical/instrumentation/data acquisition and control systems, work processes/procedures in the Propulsion and Fluid Systems Test Division would be beneficial. Experience with propulsion system test stands would be beneficial. Required skills include experience in cryogenic test facility measurement systems, activation, and data review. (b)(4)
(b)(4)

4.0 Special Tools Required

Access to Test Area data on the Jetson data server, WinPlot data analysis software, and the MSFC Supplied Software and Database, Electronic Test Preparation System.

5.0 Participating Subcontractors

None.

6.0 Milestones & Deliverables

1. Monthly Activity Reports (MARs).
2. Test Implementation Procedures as needed.
3. Facility Activation Procedures as needed.
4. Facility Operating Procedures as needed.
5. Facility modification documentation/drawings.
6. Special test equipment documentation/drawings
7. Complete Test Preparation Sheets (work authorization order) in accordance with test schedules.

7.0 Special Considerations (Recruiting, Special Equipment / Material, Safety, etc.)

This work requires Jacobs ESTS Group personnel to be present in the test area. All safety precautions shall be adhered to during the performance of this work. Any questions concerning safety and/or accessibility of the test area shall be resolved prior to performing any work. Jacobs ESTS Group personnel assigned to task order will attend monthly safety meetings. Test Area Access Safety Training is required for Test Area access.

The following Safety Training Classes are required for this task order for performing any support activities where applicable safety hazards exist: Safety Training refresher classes are not required and class participation is dependent on a non test schedule interference basis.

1. Confined Space Entry Training
2. Explosive Handler's Training

All Task Order Subelements require Lockout/Tagout, Authorized Employee training for Instrumentation/Control Engineering to write Lockout/Tagout procedures.

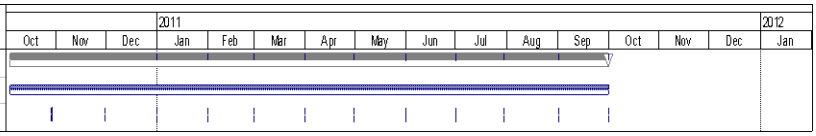
8.0 Work Shelf

The following activities could be accomplished as part of the Task Order performance by personnel that are temporarily available due to program or funding delays on other Tasks. Specific assignments will be coordinated with the Task Initiator to ensure appropriate skills and experience.

TO/Subelement	Description	Due Date	Skill

9.0 Schedule

Task Order #	Subelement	Task Work Element
36-040001	00	**Test Laboratory Manager ET10 Support**
36-040001	01	Instumentation/Control Engineering Test Support
36-040001	00	**Monthly Activity Report**



ESTS Contract Task Order Request Performance Plan

Task Order Title: CLV Engineering Test Support

Task Order Number: 36-010001 Revision: 17

Category	Weighting Technical %	End of Period Technical Score
Technical Objectives	65%	X 65% =
Provide timely, accurate, and efficient support to the Propulsion Test Branch, ET10		**Justification**

	Weighting Schedule %	Schedule Score
Schedule Objectives (Milestones)	10% *(min 10%)*	X 10% =
1. Monthly Activity/Financial Reports 2. Completion of work in accordance with test program schedules, and 3.Timely support of documentation changes necessary to maintain test configuration control.		**Justification**

	Weighting Cost%	Cost Score
Cost (actual vs. negotiated)	25% *(min.25%)*	X 25% =
		Justification

Weighting Total %	Total Score
100.00%	

Technical, Schedule, and Cost Grading Scale

Score	Description
9.0-10.0	Exceeded TO Performance Plan objectives resulting in major benefit(s)
8.0-8.9	Exceeded TO Performance Plan objectives resulting in modest benefit(s)
7.0-7.9	Met TO Performance Plan objectives
3.0-6.9	Did not meet all TO Performance Plan objectives resulting in minimal impact or requiring additional agency funds
0.0-2.9	Did not meet TO Performance Plan objectives resulting in substantial impact and/or requiring additional agency funds

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Comments:

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Risk Assessment

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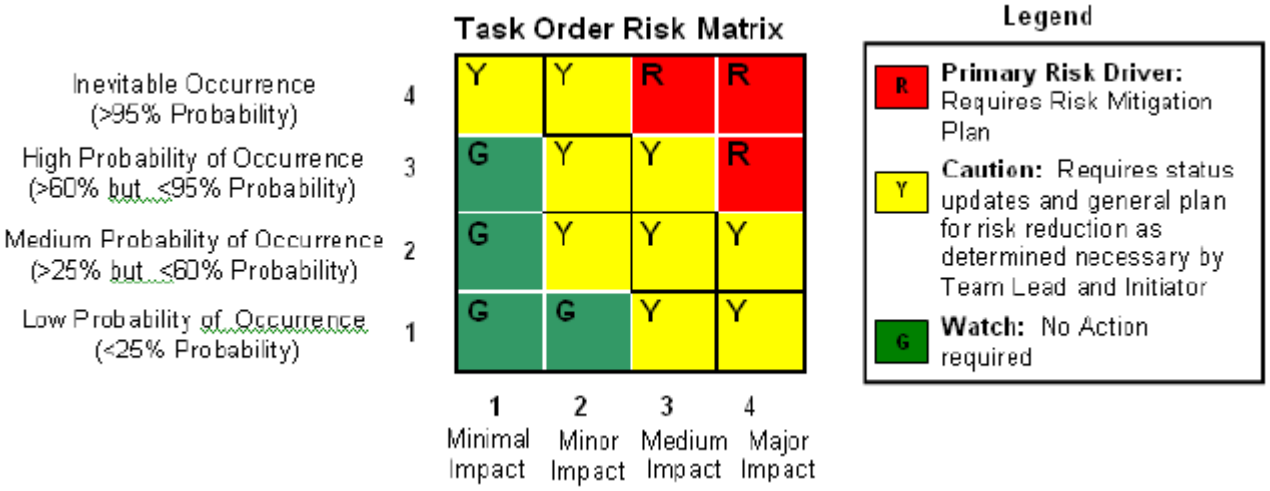
Task Order Risk Assessment to Cost, Technical, and Schedule

List identified risk associated with Task Order performance as related to task cost, technical, and schedule. Classify the risk(s) according to probability of occurrence and impact as defined below and enter the risk into risk matrix.

Risk	Risk Type	Probability (1-4)	Impact (1-4)	Risk Description
Risk C1	Cost	2	3	All of the funding may not occur.
Risk C2	Cost			
Risk T1	Technical			No technical risks have been identified for this Task Order
Risk T2	Technical			
Risk S1	Schedule	2	2	Test articles may not arrive on time
Risk S2	Schedule			

*Note: See page 2 for risk mitigation plan for those risks which are Primary Risk Drivers.



Impact Level	Cost Impact Definition	Technical Impact Definition	Schedule Impact Definition
(1) Minimal Impact	No significant cost impact	No significant technical impact	No significant schedule impact
(2) Minor Impact	Potential to recover cost	Potential to gain required technology without impact	Minor delay in deliverables but no impact to customer
(3) Medium Impact	>0 but <10% subtask cost overrun	Some technical impact but potential to recover	Delay in subtask deliverables but work arounds available and acceptable to customer
(4) Major Impact	>10% subtask cost overrun	Unable to meet technical requirements to perform subtask	Delay in subtask deliverables with impact to customer

Risk Mitigation Plan

Complete the following chart for those risks identified on page 1 as “Primary Risk Drivers”. The following chart will serve as the Risk Mitigation Plan.

Risk No.: Risk Description:		
Mitigation Step No.	Planned Completion Date	Mitigation Step Description
1		No mitigation possible. Accept risks,