Marshall Space Flight Center
Engineering, Science & Technical Services

JACOBS ESTS Group

Task Order Plan (TOP)

Contract Number: *NNM05AB50C*
TO Title: *Lunar Precursor Robotic Program Support*
TO Number: *43-040001* **Revision:** *13*

Period of Performance: *10/2/2009* to *9/30/2011*

MSFC Initiator: *Raymond French*

(b)(4)

Emergency: *No*

Revision -13: The purpose of revision -13 is to adjust estimated resources to accomplish the scope of work defined by the Customer; specifically:

1. Add travel resources for (2) trips per the customer's request.

Revision -12: 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 October 2, 2010 through September 30, 2011. Additionally, the Schedule, Performance Plan and Risk Assessment have been revised to reflect changes in task activities for the new period of performance. This revision affects support to the VP23 LPRP/LMMP Projects.

Program	Subelement	WBS	Status
VP 23, LPRP/LMMP Projects	00	132438.01.10.01	Mapped to 43-040001-GA
VP 23, LPRP/LMMP Projects	GA	132438.01.10.01	Open

Revision -11: The purpose of this revision is to extend this task into Contract Year 5 of the NNM05AB50C ESTS contract. This revision defines and estimates work for the period October 3, 2009 through October 14, 2010. Additionally, the Schedule, Performance Plan and Risk Assessment have been revised to reflect changes in task activities for the new period of performance. This revision affects support to the VP23 LPRP/LMMP Projects.

Funding for this task is provided per WBS: 132438.01.10.01

Revision -10: The purpose of revision -10 is to adjust estimated resources to accomplish the scope of work defined by the Customer; specifically:

2. Increase labor hours to support project schedules.
3. Decrease travel resources.

Revision -09: The purpose of this revision is to extend this task into Contract Year 4 of the NNM05AB50C ESTS contract. This revision deletes subelement -01 and defines and estimates work for the period September 27, 2008 through October 2, 2009. Additionally, the Schedule, Performance Plan and Risk Assessment have been revised to reflect changes in task activities for the new period of performance.

The purpose of Revision -08 is to add estimated labor resources and travel to accomplish the additional scope of work defined by the Customer; specifically:

1. Add (b)(4) to subelement -00 with a corresponding increase in cost.
2. Add (b)(4) to subelement -00 for additional travel.
3. Change the MSFC Initiator name from David Jacobson to Brian Key.

The purpose of Revision -07 is to add estimated resources to accomplish the additional scope of work defined by the Customer; specifically:

1. Add (b)(4) to subelement -01 for subcontractor consultation.
2. Change the MSFC Initiator name from Nikhat Shahzad to David Jacobson.
3. Change the (b)(4)

Additionally, the Schedule, Performance Plan and Risk Assessment have been revised to reflect changes in task activities for the period of performance.

The purpose of Revision -06 is to extend this task into Contract Year 3 of the NNM05AB50C ESTS contract. This revision defines and estimates work for the period 29 September 2007 through 28 September 2008. Additionally, the Schedule, Performance Plan and Risk Assessment have been revised to reflect changes in task activities for the new period of performance.

The purpose of Revision -05 is to add additional direct support labor resources to better define actual task activities; specifically:

1. Add (b)(4)
2. Change the MSFC Initiator name from Monica Hammond to Nikhat Shahzad.
3. Change the (b)(4)
4. Change the

The purpose of Revision 04 is to remove (b)(4) to account for reduced task order scope for the Lunar Precursor Robotic Program Office.

The purpose of Revision 03 is to change the labor category for (b)(4) position, as the position required more experience than was originally estimated. In addition, the labor category for the (b)(4) is being upgraded, effective March 2007.

The purpose of Revision 02 is to extend this task into Contract Year 2 of the NNM05AB50C ESTS contract. This revision defines and estimates work for the period 30 September 2006 through 28 September 2007. This revision adds (b)(4) to the task, along with required skills, milestones and deliverables. Additionally, the Schedule, Performance Plan and Risk Assessment have been revised to reflect changes in task activities for the new period of performance.

The purpose of Revision 01 is to add (b)(4) in travel due to change in scope requiring travel to Johns Hopkins University Applied Physics Laboratory and to Goddard Space Flight Center. In addition, (b)(4) (b)(4) were removed to account for reduced scope for schedule support.

This Task Order (TO) replaces part of TO 14-040401 due to the NASA/MSFC reorganization and the subsequent realignment of the NNM05AB50C ESTS contract. This TO defines and estimates work for the period 1 April 2006 through 29 September 2006. Funding for this task is provided per MSFC PR 420015492. The WBS for this task is 278083.01.01.03.05. Additionally, the Schedule, Performance

Plan and Risk Assessment have been revised to reflect changes in task activities for the new period of performance.

1.0 Task Order Description & Objectives

This TO will provide direct support to the Lunar Precursor Robotic Program (LPRP) and Project Planning, Integration and Management office by providing technical, schedule, graphics and programmatic support during the integration phase of the LPRP.

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

43-040001-00 LPRP Project Coordinator

The scope of this task is encompassed by relevant activity associated with the following goals to be accomplished by the Contractor:

- Perform implementation phase planning and support activities (interface identification, document development & maintenance, schedule development, etc.)
- Provide backup support to maintain LPRP/LMMP server documentation system using ESMD Windchill environment.
- Develop LPRP/LMMP specific papers for submittal to AIAA, ASCE, and other appropriate technical forums.
- Develop Program Weekly Status.

The Contractor shall also provide scheduling/Earned Value Management (EVM)/project control expertise to the LPRP, including:

- Develop trade study schedules
- Integrate, maintain and status formulation and implementation phase activity schedules
- Develop EVM approach for LPRP/LMMP
- Develop schedules
- Perform schedule assessments/evaluations using Health-Check tool.

Regular input for presentations to brief management on status of various assigned activities, including monthly and quarterly reviews, are included.

Review all technical and programmatic issues. Generate recommendations for solving issues as required.

Develop/maintain implementation plans and other Program documents as required.

Develop regular presentations to management on LPRP/LMMP activities including monthly and quarterly reviews, as required.

Develop Project-specific presentations in support of Program/Project Review activities.

Support LPRP by providing program/project-specific management support capabilities, including scheduling, EVM support, risk-management support, and other project control functions.

43-040001-01 LPRP/ALTAIR Project Support (Deleted per Revision -09)

Provide consultant support to the ALTAIR Project, VP40, at the MSFC. This includes review of the ALTAIR Process, Operational Concept support, functional analysis, and requirements development. Tasks will be at the vehicle level, propulsion subsystem, and avionics subsystem level.

The (b)(4) [redacted]
has been tasked to support the ALTAIR Project, VP40, by conducting the following tasks in support of this project.

- Develop performance estimates (via TDK analysis) of candidate propellant combinations for use in the ALTAIR. Candidates include cold gas (He or N2), warm helium (tridyne), monopropellant (N2H4), bipropellant systems (NTO/MMH, LOX/LCH4, LOX/N2H4, LOX/RP1, LOX/Ethanol). These performance estimates would vary MR, Pc, AR. Data would be needed on the perceived envelope for the engine to insure that the expansion of the nozzle does not exceed the dedicated volume. Other values needed include burn time, thrust required, torque, etc. A detailed list of requirements would be given by (b)(4) [redacted] to the VP40/ER23 POC.

- Develop system sizing relationships for each of the propellant combinations above for the ALTAIR. Propulsion energy (ΔV and Mo) would be needed in order to determine the mass of propellant needed to achieve the mission. Areas subject to trade include the tank material and the fault tolerance of the system. Investigations would be undertaken to determine the existence of already designed and built engines that could provide the necessary capability required. Again, a detailed list of requirements would be given by the (b)(4) [redacted] to the VP40/ER23 POC.

- Conduct sensitivity analysis on the ALTAIR configurations defined in step 2. Understand what the impact is to the system when various parameters of the engine are changed. This step would allow for a further development of the engine requirements for the ALTAIR.

- Understand the added benefit of increasing the fault tolerance of the ALTAIR. (b)(4) [redacted] would conduct an informal FMEA on the proposed ALTAIR configuration to understand the areas of increased fault tolerance. This would be quantified as a penalty to mass.

- Provide status briefings to VP40/ER23 personnel as well as ALTAIR project office personnel on an as needed basis.

- Provide a final report outlining the findings.

3.0 Discussion of Skills Required

Project Coordinator Support with (b)(4) [redacted]
(b)(4) [redacted]

4.0 Special Tools Required

None

5.0 Participating Subcontractors

None.

6.0 Milestones & Deliverables

Monthly Activity Report (MAR), Trip Reports, other as assigned
S&MS Monthly presentation to include schedule/milestone status
Weekly Action List
Weekly Team Calendar
Weekly/Monthly Schedule updates
Schedule & EVM evaluation status as assigned
Risk-Management Reports
MAR, reports, plans, and other system engineering products shall be delivered as negotiated to meet the assigned project needs.

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

Travel: 2 Trips x 1 person x 3 days x JSC

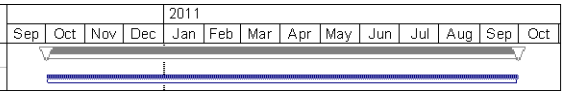
8.0 Work Shelf

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 Order #	Task Work Element
43-040001	**GA**	**43-040001**	**LPRP Program Office Support**
43-040001	GA	43-040001	LPRP/LMMP Program Support



ESTS Contract Task Order Request Performance Plan

Task Order Title: RLEP-2 Project Office Support

Task Order Number: 43-040001 Revision: 13

Category	Weighting Technical %	End of Period Technical Score
Technical Objectives	65%	X 65% =
		Justification
Provide technical and programmatic support for all LPRP/LMMP Office activities. Provide schedule support to include overview/development and detailed schedules, and reports to support management reviews and team meetings. Perform Health-Check assessments on Program/Project schedules as required. Participate in LPRP/LMMP team meetings as required. Prepare S&MS Monthly presentations, Program Weekly Status, and provide back-up support for Windchill website. Develop and prepare Program documents/plans as required. Support Risk-Management activities.		

	Weighting Schedule %	Schedule Score
Schedule Objectives (Milestones)	10% *(min 10%)*	X 10% =
		Justification
Provide reports, metrics, schedules in a timely manner to support LPRP/LMMP activities and milestones. Provide/update team weekly action lists and calendar. Monthly Activity Report, Trip Reports, other as assigned S&MS Monthly presentation to include schedule/milestone status. Weekly/Monthly Schedule updates. Schedule & EVM evaluation status as assigned. Support risk-management milestones. MAR, reports, plans, and other		

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system engineering products shall be delivered as negotiated to meet the assigned project needs.		
Cost (actual vs. negotiated)	**Weighting Cost%** 25% *(min.25%)*	**Cost Score** X 25% =
		Justification
	Weighting Total % 100.00%	**Total Score**

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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(b)(4)

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			No cost risks have been identified for this Task Order.
Risk C2	Cost			
Risk T1	Technical			No technical risks have been identified for this Task Order.
Risk T2	Technical			
Risk S1	Schedule			No schedule risks have been identified.
Risk S2	Schedule			

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

Task Order Risk Matrix

		1 Minimal Impact	2 Minor Impact	3 Medium Impact	4 Major Impact
Inevitable Occurrence (>95% Probability)	4	Y	Y	R	R
High Probability of Occurrence (>60% but <95% Probability)	3	G	Y	Y	R
Medium Probability of Occurrence (>25% but <60% Probability)	2	G	Y	Y	Y
Low Probability of Occurrence (<25% Probability)	1	G	G	Y	Y

Legend

- R — **Primary Risk Driver:** Requires Risk Mitigation Plan
- Y — **Caution:** Requires status updates and general plan for risk reduction as determined necessary by Team Lead and Initiator
- G — **Watch:** No Action required

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