Marshall Space Flight Center
Engineering, Science & Technical Services

JACOBS
ESTS Group

Task Order Plan (TOP)

Contract Number: *NNM05AB50C*
TO Title: *Technology Development and Demonstration*
TO Number: *45-010014* **Revision:** *02*

Period of Performance: *10/2/2010* to *3/31/2011*

MSFC Initiator: *Stephan Davis*

(b)(4) [redacted]

Emergency: *No*

Revision History

Revision 2: The purpose of this revision is to extend support for this flagship demonstration support task, also known as the Cryogenic Storage and Transfer (CRYOSTAT) risk reduction activity, into Contract Year 6 (CY6) of the NNM05AB50C ESTS contract, as outlined by the MSFC Task Initiator. This revision defines and estimates work for the period October 2, 2010 to March 31, 2011. Additionally, the Schedule, Performance Plan, and Risk Assessment have been revised to reflect the new period of performance.

In summary, the total estimated cost for CY6 is (b)(4) [redacted] The total estimated cost includes an estimated direct labor cost of (b)(4) [redacted] for project coordinator support, and a subcontractor cost estimate of (b)(4) [redacted] for subject matter expert support.

Sub-element	Program or Project	WBS, Project Code, or Equivalent for Funding
FA	Flagship Demonstration	095240.04.02.25.01.01.08

Revision 1: The purpose of this revision is to reallocate the estimated cost of travel to the estimated cost of subcontractor support. This increase in subcontractor support will help meet the Task Initiator's schedule in developing documentation for the CRYOSTAT Mission Concept Review.

In summary, reduced travel by (b)(4) [redacted] and increased the subcontractor cost estimate by (b)(4) [redacted] Also, readjusted the cost estimate in August, September, and October to reflect the replan in subcontractor support. Note: the overall cost estimate did not change, but the cost was increased by (b)(4) [redacted] in FY10 and decreased by (b)(4) [redacted] in FY11 to reflect the task order end date of October 1, 2010.

1.0 Task Order Description and Objectives

This task requires subject matter expertise in systems engineering and project management including project coordination. Subject Matter Experts (SMEs) will support the development and demonstration of emerging space systems technologies and the application of said technologies via platforms such as the CRYOSTAT. The task team will perform research, systems analysis, requirements analysis, and project coordination, and prepare associated documentation.

2.0 Technical Approach

45-010014-FA Flagship Demonstration Systems Engineering Support

The task team will provide the following support to enable technology maturation and platform development leading to potential in-space demonstrations:

- Perform systems analysis by formulating alternatives, researching and assessing the alternatives, and recommending go-forward approaches. This includes identifying risks and generating mitigation plans. Prepare reports and present results.
- Participate in technical working groups, forums, technical interchange meetings, and study teams. Provide SME inputs and recommendations.
- Perform requirements analysis that includes assessing needs and deriving or reviewing concepts of operations, functional flow diagrams, life cycle studies and associated derived requirements. Prepare or provide inputs for associated requirements documentation such as the Mission Needs, Goals, Objectives, and Constraints Document, and the Mission Requirements Document.
- Prepare planning documentation including inputs for the Systems Engineering Management Plan (SEMP), and Project Plan, per NPR 7123.1A, NASA Systems Engineering Processes and Requirements and NPR 7120.5D, NASA Spaceflight Program and Project Management Requirements, respectively. Other documentation includes white papers, review plans, schedule assessments, project level status reports, tracking of issues, and technical summaries.
- Review documentation and provide comments for use by control board evaluation or general concept and/or design development. Provide SME recommendations.
- Perform project coordination by coordinating events, disseminating data relevant to project activities, maintaining project level information databases, setting up meetings including appropriate information technology (e.g., audio conference, video conference, web based conference (e.g., Webex)), and support project integration type activities (e.g., data capture and archive, scheduling, minutes of meetings, newsletters, presentations, and planning).

3.0 Discussion of Skills Required

Key personnel assigned to this task shall have excellent written and verbal communication skills for each of the following skills:

- Systems engineering and project documentation SME support personnel shall have a (b)(4) (b)(4) [redacted]
- The Project Coordinator shall have (b)(4) [redacted] (b)(4) [redacted]

4.0 Special Tools Required

Not Applicable

5.0 Participating Subcontractors

- (b)(4) [redacted]

6.0 Milestones and Deliverables

- Reports, charts, or emails that document findings from evaluations, assessments, and data collection activities

- Inputs for technical documentation (e.g., a section of a project plan, SEMP, requirements documents, functional flow diagrams, summary of results, descriptions, and definitions)
- Monthly Activity Reports (MARs)

7.0 Special Considerations

Not Applicable

8.0 Work Shelf

Not Applicable.

9.0 Schedule

Task Order	Subelement	Activity	2010				2011									
			Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
45-010014		Technology Development and Demonstration														
45-010014	-FA	Flagship Demonstration Systems Engineering Support														

ESTS Contract Task Order Request Performance Plan

Task Order Title: Technology Development and Demonstration

Task Order Number: 45-010014 Revision: 02

Category	Weighting Technical %	End of Period Technical Score
Technical Objectives	65%	X 65% =
		Justification
• Collect data via research of historical and state-of-the-art sources • Perform feasibility assessments and evaluate concepts • Prepare function flow diagrams to support requirements analysis • Review documentation and generate inputs for technical reports and plans		
Schedule Objectives (Milestones)	**Weighting Schedule %** 10% *(min 10%)*	**Schedule Score** X 10% =
		Justification
• Reports, charts, or emails that document findings from evaluations, assessments, and data collection activities • Inputs for technical documentation (e.g., a section of a project plan, SEMP, functional flow diagrams, summary of results, descriptions, and definitions) • Monthly Activity Reports		
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

Comments: None

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Risk Assessment

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(b)(4)

Task Order Risk Assessment to Cost, Technical, and Schedule

The following table lists identified risks associated with the performance of this task order as related to task cost, schedule, and technical subject matter. Each identified risk is classified according to probability of occurrence and impact as defined in the Task Order Risk Matrix and Risk Definitions Table.

Risk No.	Risk Type	Probability (1-4)	Impact (1-4)	Risk Description
C1	Cost	1	3	Products take longer to complete than estimated, therefore impacting cost.
S1	Schedule	1	3	Products take longer to complete than estimated, therefore impacting planned reviews.
T1	Technical	Not applicable	Not appli-cable	Not applicable

*Note: See next page for risk mitigation plan for those risks categorized as 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

Table. Risk Definitions

Risk Mitigation Plan

The following table serves as the Risk Mitigation Plan for those risks identified as primary risk drivers.

Risk No.: Not Applicable **Risk Description:** Not Applicable		
Mitigation Step No.	**Planned Completion Date**	**Mitigation Step Description**
Not Applicable	Not Applicable	Not Applicable