Marshall Space Flight Center
Engineering, Science & Technical Services

JACOBS ESTS Group

Task Order Plan (TOP)

Contract Number: *NNM05AB50C*
TO Title: *First Stage Office*
TO Number: *45-020001* **Revision:** *21*

Period of Performance: *10/02/2010* to *3/31/2011*

MSFC Initiator: *Janet Crawford*

(b)(4)

Emergency: *No*

Revision 21: (WBS 522632.08.01.01)

The purpose of this revision is to extend this task into Contract Year 6 (CY6) of the NNM05AB50C ESTS contract. It should be noted that subelements CA, CC, CE, CF, CG, CH and CI were administratively closed in Contract Year 5 as a result of the Constellation/Ares replan effort. The work under these closed subelements was transferred to Task Order 45-000001 except subelement –CG which was discontinued.

Subelement -05, the only remaining subelement, was closed in this revision and changed to subelement –SA in accordance with agreed to CY6 subelement lettering nomenclature. Subelement –SA will provide Shuttle Thrust Vector Control and Avionics support and has a period of performance from October 2, 2010 through March 31, 2011 per the customer.

Note: The Detailed Cost Summary (DCS) shows cost estimate beyond March 31, 2011 due to the fact that receipt of subcontractor invoices/effort for a particular month are not received until the following month (actual subcontractor effort will end March 31, 2011). Labor costs in the DCS after March 31, 2011 are required for administrative close out of the task order.

The Schedule, Performance Plan and Risk Assessment have been reviewed and revised as required to reflect changes in task activities for the new period of performance.

Total estimated cost for this task is (b)(4)

Revision 20: This revision modifies three (3) subelements of this Task Order Plan (TOP) per the Customer's request, and adds a new subelement -05 that replaces subelement -O1. The overall cost impact to the task is an increase in total estimated cost of (b)(4)

- Subelement -CC: (WBS 136905.08.01.04) The Travel cost estimate was increased by (b)(4) in response to the Customer's request for more travel than was originally estimated. Total cost increase for this subelement is (b)(4)

- Subelement -CE: (WBS 136905.08.01.02.01.08) The Subcontractor cost estimate was increased by (b)(4) in response to the Customer's request for more travel than was originally estimated. Total cost increase for this subelement is (b)(4)
- Subelement -CG: (WBS 136905.08.01.19.01) The WBS number for this subelement was updated at the Customer's request. There is no impact to the total subelement estimated cost.
- Subelement -O1: Closed in this revision.
- Subelement -05: (WAS Subelement -O1) (WBS 522632.08.01.01) This revision opens subelement -05. This new subelement replaces -O1, thus eliminating an invalid subelement nomenclature. Additionally, this revision eliminates confusion between subelement -O1 and a prior subelement for this TOP, -01, which was deleted from this TOP in Revision 3. There is no impact to the total subelement estimated cost.

Additionally, the Schedule, Performance Plan and Risk Assessment were evaluated for possible impacts as a result of this change in scope. The Schedule was changed to show the new subelement -05 and closure of subelement -O1.

Revision 19: This revision modifies one (1) subelement of this Task Order Plan (TOP) and adds a new subelement, -O1. The overall cost impact to the task is an increase in estimated cost of (b)(4)

- Subelement -CF: The Direct Labor Hour estimate was increased by (b)(4) and the Subcontractor support estimate was increased by (b)(4) to reflect additional scope of work on this Subelement in accordance with a request from the Customer. Total cost increase for this subelement is (b)(4)
- Subelement -O1: Added a new Subelement, Thrust Vector Control (TVC) and Avionics Support to RSRM, to the TOP at the request of the Customer, in order to provide a level of effort as needed. Total cost impact of this additional effort is (b)(4)

Additionally, the Schedule, Performance Plan and Risk Assessment were evaluated for possible impacts as a result of this change in scope.

Revision 18: This revision modifies two (2) subelements of this Task Order Plan (TOP) and adds a new subelement, -CI. The overall cost impact to the task is an increase in estimated cost of (b)(4)

- Subelement -CD: Support from this subelement will no longer be required by the FS Element Office as of January 1, 2010. The Direct Labor Hour estimate was reduced by (b)(4) and the Subcontractor support estimate was decreased by (b)(4) due to deletion of all hours and Subcontractor costs allocated from January 2010 onward, which reflects this reduction in effort. Total cost decrease for this subelement is (b)(4)
- Subelement -CH: The Subcontractor support estimate was reallocated within FY10 to reflect required customer support. There is no impact to the total subelement estimated cost.
- Subelement -CI: Added a new Subelement, Project Planning and Scheduling, to the TOP to better meet the needs of the First Stage (FS) Element Office. Total cost impact of this additional effort is (b)(4)

Additionally, the Schedule, Performance Plan and Risk Assessment were evaluated for possible impacts as a result of this change in scope.

Revision 17: 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 the First Stage APO element.

Revision 16: This revision modifies seven (7) subelements of this Task Order Plan (TOP). The overall cost impact to the task is a decrease in estimated cost of (b)(4)

- Subelement -CA: The Direct Labor Hour estimate was reduced by (b)(4) to reflect less required customer support than originally estimated. In addition, the Travel and ODC estimates were reduced by (b)(4) respectively, to reflect less required travel and ODC expenditures than originally estimated. Total cost decrease for this subelement is (b)(4)
- Subelement -CC: The Direct Labor Hour estimate was reduced by (b)(4) to reflect less required customer support than originally estimated. In addition, the Travel and ODC estimates were reduced by (b)(4) respectively, to reflect less required travel and ODC expenditures than originally estimated. Total cost decrease for this subelement is (b)(4)
- Subelement -CD: The Direct Labor Hour estimate was reduced by (b)(4) to reflect less required subcontract management than originally estimated. The Subcontractor support estimate was decreased by (b)(4) to reflect a more accurate representation of subcontractor invoicing and because the original estimate of the planned work was too high. Total cost decrease for this subelement is (b)(4)
- Subelement -CE: The Direct Labor Hour estimate was reduced by (b)(4) to reflect less required customer support than originally estimated. The Subcontractor support estimate was decreased by (b)(4) to reflect a more accurate representation of subcontractor invoicing and because the original estimate of the planned work was too high. Total cost decrease for this subelement is (b)(4)
- Subelement -CF: The Direct Labor Hour estimate was reduced by (b)(4) to reflect less required customer support and less subcontract management than originally estimated. The subcontractor estimate was also reduced by (b)(4) to more accurately reflect the correct timing of invoice deliveries from the multiple subcontractors on this subelement. Lastly, the travel estimate was reduced by (b)(4) to better reflect planned activities through the end of the year. Total cost decrease for this subelement is (b)(4)
- Subelement -CG: The Direct Labor Hour estimate was reduced by (b)(4) to reflect less required subcontract management than originally estimated. The Subcontractor support estimate was decreased by (b)(4) to more accurately reflect the correct timing of subcontractor invoice deliveries and because the original estimate of the planned work was too high. Total cost decrease for this subelement is (b)(4)
- Subelement -CH: The Direct Labor Hour estimate was reduced by (b)(4) to reflect less required subcontract management than originally estimated. The Subcontractor support estimate was decreased by (b)(4) to more accurately reflect the correct timing of subcontractor invoice deliveries and because the original estimate of the planned work was too high. Total cost decrease for this subelement is (b)(4)

Additionally, the Schedule, Performance Plan and Risk Assessment were evaluated for possible impacts as a result of this change in scope.

Revision 15: This revision modifies seven (7) subelements of this Task Order Plan (TOP). The overall cost impact to the task is an increase in estimated cost (b)(4)

- Subelement -CA: Direct Labor Hour and Other Direct Cost (ODC) estimates were reallocated within FY09 to reflect required customer support. There is no impact to the total subelement estimated cost.
- Subelement -CC: Direct Labor Hour, Travel and ODC estimates were reallocated within FY09 to reflect required customer support. There is no impact to the total subelement estimated cost.
- Subelement -CD: The Subcontractor support estimate was increased by (b)(4) to reflect required customer support due to the Ares I-X schedule slip. Direct Labor Hour estimates were also reallocated within FY09 to reflect required customer support. Total cost increase for this subelement is (b)(4)

- Subelement -CE: The Subcontractor support estimate was increased by (b)(4) to reflect required customer support due to the Ares I-X schedule slip. Direct Labor Hour estimates were also reallocated within FY09 to reflect required customer support. Total cost increase for this subelement is (b)(4)
- Subelement -CF: Direct Labor Hour and Travel estimates were reallocated within FY09 to reflect required customer support. There is no impact to the total subelement estimated cost.
- Subelement -CG: The Subcontractor support estimate was increased by (b)(4) to reflect required customer support due to the Ares I-X schedule slip. Labor Hour estimates were also reallocated within FY09 to reflect required customer support. Total cost increase for this subelement is (b)(4)
- Subelement -CH: Direct Labor Hour and Subcontractor support estimates were reallocated within FY09 to reflect required customer support. There is no impact to the total subelement estimated cost.

Additionally, the Schedule, Performance Plan and Risk Assessment were evaluated for possible impacts as a result of this change in scope.

Revision 14: This revision modifies seven (7) subelements of this Task Order Plan (TOP). The overall cost impact to the task is an increase in estimated cost of (b)(4)

- Subelement -CA: Direct Labor Hour and Other Direct Cost (ODC) estimates were reallocated within FY09 to reflect required customer support. There is no impact to the total subelement estimated cost.
- Subelement -CC: Direct Labor Hour, Travel and ODC estimates were reallocated within FY09 to reflect required customer support. There is no impact to the total subelement estimated cost.
- Subelement -CD: The Subcontractor support estimate was reallocated within FY09 to reflect required customer support. There is no impact to the total subelement estimated cost.
- Subelement -CE: The Subcontractor support estimate was reallocated within FY09 to reflect required customer support. There is no impact to the total subelement estimated cost.
- Subelement -CF: The Direct Labor Hour estimate was reallocated within FY09 to reflect required customer support. There is no impact to the total subelement estimated cost due to this reallocation. Subcontractor support costs were also increased by an additional (b)(4) to reflect the actual cost estimate of the quote received from the subcontractor. The actual subcontractor quote came in higher than the original estimate, which was determined from an actual-to-estimate ratio based on fiscal year 2008 contractor support costs. Total cost increase for this subelement is (b)(4) all of which is due to the increase in subcontractor support costs.
- Subelement -CG: The Subcontractor support estimate was reallocated within FY09 to reflect required customer support. There is no impact to the total subelement estimated cost due to this reallocation. The ODC estimate was also increased by (b)(4) to account for costs incurred in hiring a subcontractor employee to support this subelement. Total cost increase for this subelement is (b)(4) all of which is due to the increase in ODC.
- Subelement -CH: The Subcontractor support estimate was reallocated within FY09 to reflect required customer support. There is no impact to the total subelement estimated cost.

Additionally, the Schedule, Performance Plan and Risk Assessment were evaluated for possible impacts as a result of this change in scope.

Revision 13: The purpose of this revision is to extend this task into Contract Year 4 of the NNM05AB50C ESTS contract. This revision 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. This revision

affects the following APO elements: First Stage Subelements -CA, -CC, -CD, -CE, -CF and -CG. This revision also adds a new subelement, -CH, to the First Stage task.

Revision 12: This revision modifies five (5) subelements of this Task Order Plan (TOP), and adds a new subelement, -CG. The overall cost impact to the task is a decrease in estimated cost of (b)(4)

- Subelement -CA: The Travel estimate was increased by (b)(4) to account for travel taken during the fiscal year (2008) in support of the Project Office. The Direct Labor hour estimate was decreased by (b)(4) as fewer resources were required to accomplish the work than originally estimated. The Other Direct Cost estimate was increased by (b)(4) to account for continuing education costs incurred. The subcontractor support estimate was decreased by (b)(4) to more accurately reflect the actual task support needed. Total cost decrease for this subelement is (b)(4)
- Subelement -CC: The Travel estimate was decreased by (b)(4) to better reflect the actual task support needed. The Direct Labor hour estimate was decreased by (b)(4) as fewer resources were required to accomplish the work than originally estimated. Total cost decrease for this subelement is (b)(4)
- Subelement -CD: Subcontractor support costs were increased by (b)(4) to account for a subcontractor invoice presented for hours worked in FY07. This invoice was inadvertently overlooked during FY07 and was instead submitted for processing in June 2008. Subcontractor support costs were also increased by an additional (b)(4) to more accurately reflect the actual task support required during the fiscal year. Direct Labor hours (b)(4) were added to better reflect management support of this subelement. Total cost increase for this subelement is (b)(4)
- Subelement -CE: Subcontractor support costs were decreased by (b)(4) to more accurately reflect the actual task support needed. Direct Labor hours (b)(4) were added to better reflect management support of this subelement. Total cost decrease for this subelement is (b)(4)
- Subelement -CF: Direct Labor hours were reallocated through the fourth quarter of the fiscal year to better reflect actual task support required, with no change in overall hours estimated. The Other Direct Cost estimate was increased by (b)(4) to account for expenses associated with the hiring of a new employee. The travel estimate was increased by (b)(4) to better reflect the actual task support needed. Subcontractor support costs were decreased by (b)(4) to more accurately reflect the actual task support needed. Total cost decrease for this subelement is (b)(4)
- Subelement -CG: Added a new Subelement, Systems and Documentation Requirements Lead, to the TOP to better meet the needs of the First Stage (FS) Element Office. Total cost impact of this additional effort is (b)(4)

Additionally, the Schedule, Performance Plan and Risk Assessment were evaluated for possible impacts as a result of this change in scope.

Revision 11: This revision modifies Subelement -CF of this Task Order Plan (TOP). The Subcontractor support estimate was increased to reflect additional Subcontractor expertise needed by the First Stage Project Office for the Thrust Vector Control system. Additionally, the Schedule, Performance Plan and Risk Assessment were evaluated for possible impacts as a result of this change in scope. The overall cost impact to the task is an increase in estimated cost of (b)(4)

Revision 10: This revision modifies three (3) subelements of this Task Order Plan (TOP). The overall cost impact to the task is an increase in estimated cost of (b)(4)

- Subelement -CA: The Other Direct Cost estimate was increased by (b)(4) to account for continuing education costs. The Subcontractor support estimate was increased by (b)(4) to more accurately reflect the actual task support needed. Total cost increase for this subelement is (b)(4)

- Subelement -CD: Subcontractor support costs were reallocated from the first quarter to the last quarter of the fiscal year (2008) to better align with the subcontractor billing cycle and thus to provide better tracking of subcontractor costs through the Contract Year. Since this revision is merely a reallocation of the estimated costs, there is no impact to either the total estimated level of subcontractor support or the overall cost of this subelement.
- Subelement -CE: Subcontractor support costs were reallocated from the first quarter to the last quarter of the fiscal year (2008) to better align with the subcontractor billing cycle and thus to provide better tracking of subcontractor costs through the Contract Year. Since this revision is merely a reallocation of the estimated costs, there is no impact to either the total estimated level of subcontractor support or the overall cost of this subelement.
- Task Initiator has been changed from Randy Wright to Janet Crawford.

Revision 09: The purpose of Revision 09 is to extend this task into Contract Year 3 of the NNM05AB50C contract. This revision defines and estimates work for the period 29 September 2007 through 26 September 2008. 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 adds Subelement -CF, Thrust Vector Control Support, to the existing four (4) subelements of this task. Subcontractor avionics support and Direct Labor support for the First Stage Avionics and Control Team that was previously added to Subelement -CA in Revision 06 is moved to Subelement -CF in this revision.

Revision 08: This revision modified four (4) subelements of this Task Order Plan (TOP) to better align with actual cost incurred in support of the First Stage (FS) Element Office. The overall cost impact resulting from this revision is a decrease in estimated cost of (b)(4)

- Subelement -CA: The Subcontract Estimate was decreased by (b)(4) and the Labor Estimate was decreased by (b)(4) to more accurately reflect the actual task support needed. Total cost decrease for this subelement is (b)(4)
- Subelement -CC: The Other Direct Cost was increased by (b)(4), to account for "unaccounted for" relocation expenses. The Labor Estimate was increased by (b)(4) and the Travel Estimate was increased by (b)(4) to better reflect the actual task support needed. Total cost increase for this subelement is (b)(4)
- Subelement -CD: The Subcontract Estimate was decreased by (b)(4) to more accurately reflect the actual task support needed. Total cost decrease for this subelement is (b)(4)
- Subelement -CE: The Subcontract Estimate was decreased by (b)(4) to more accurately reflect the actual task support needed. Total cost decrease for this subelement is (b)(4)

Revision 07: This revision modifies four (4) subelements of this Task Order Plan (TOP) to better meet the needs of the First Stage (FS) Element Office. The overall cost impact resulting from this revision is a decrease in estimated cost of (b)(4)

- Subelement -CA: The Subcontract Estimate was decreased by (b)(4) and the Labor Estimate was decreased by (b)(4) to more accurately reflect the actual task support needed. Total cost decrease for this subelement is (b)(4)
- Subelement -CC: The (b)(4) was increased by (b)(4), to (b)(4) (b)(4) (b)(4) The Labor Estimate was increased by (b)(4), and the Travel Estimate was increased by (b)(4) to better reflect the actual task support needed. Total cost increase for this subelement is (b)(4)
- Subelement -CD: The Labor Estimate was decreased by (b)(4) and the Subcontract Estimate was decreased by (b)(4) to more accurately reflect the actual task support needed. Total cost decrease for this subelement is (b)(4)

- Subelement -CE: The Labor Estimate was decreased by (b)(4) and the Subcontract Estimate was increased by (b)(4) to more accurately reflect the actual task support needed. Total cost increase for this subelement is (b)(4)

Additionally, the Schedule, Performance Plan and Risk Assessment were evaluated for possible impacts as a result of this change in scope.

Revision 06: This revision modifies one (1) subelement of this Task Order Plan (TOP) to better meet the needs of the First Stage (FS) Element Office. The overall cost impact resulting from this revision is an increase in estimated cost of (b)(4)

- Subelement -CA: The Subcontractor Cost estimate was increased by (b)(4) to add subcontractor avionics support for the First Stage Avionics and Control Team. The Labor Estimate was also increased by (b)(4) to add Thrust Vector Control support to the First Stage Avionics and Control Team.

Additionally, the Schedule, Performance Plan and Risk Assessment were evaluated for possible impacts as a result of this change in scope.

Revision 05: This revision modifies four (4) subelements and deletes one (1) subelement of this Task Order Plan (TOP) to better meet the needs of the First Stage (FS) Element Office. The overall cost impact resulting from this revision is a decrease in estimated cost of (b)(4)

- Subelement -CA: The Other Direct Cost was decreased by (b)(4) to more accurately reflect the actual task support needed. The Labor Estimate was increased by (b)(4) to reflect a personnel change from ODC to Direct Labor and to reflect a change in task leadership. This increase also better reflects the projected task effort for March through September 2007.
- Subelement -CB: This subelement is deleted in this revision. Support from this subelement is no longer required by the FS Element Office primarily due to a several-month schedule slip of the FS PDR. The Labor Estimate was reduced by (b)(4) due to deletion of all hours allocated from February 2007 onward. The unused Travel Estimate from Subelement -CB was moved to subelement -CC (see below).
- Subelement -CC: The Travel Estimate was increased by (b)(4) to better reflect the actual task support needed. In addition, Labor hours were decreased to better reflect the projected task effort for March through September 2007, decreasing the Labor estimate by (b)(4)
- Subelement -CD: Labor cost was increased by (b)(4) to reflect a change in task leadership.
- Subelement -CE: Labor cost was increased by (b)(4) to reflect a change in task leadership.

Additionally, the Schedule, Performance Plan and Risk Assessment were evaluated for possible impacts as a result of this change in scope.

Revision 04: This revision modifies the four (4) subelements of this Task Order Plan (TOP) to better meet the First Stage (FS) Element Office's needs. The overall cost impact resulting from this revision is an increase in estimated cost of (b)(4)

- Subelement -CA: The Other Direct Cost was increased by (b)(4) to reflect the increase in the scope of this subelement to add meeting supplies and support for the FS Systems Requirements Review (SRR) meetings.
- Subelement -CB: The Labor Estimate was reduced by (b)(4) to more accurately reflect the estimated cost for the labor supporting this subelement
- Subelement -CC: The Labor Estimate was increased by (b)(4) due to a difference in labor categories initially estimated. The (b)(4) (b)(4) The total overall cost increase to this subelement is (b)(4)

- Subelement -CD: The Labor Estimate was increased by (b)(4) to reflect the need for additional subcontractor oversight support.
- Subelement -CE: The Labor Estimate was increased by (b)(4) to reflect the need for additional subcontractor oversight support.

Additionally, the Schedule, Performance Plan and Risk Assessment were evaluated for possible impacts as a result of this additional scope.

Revision 03: The purpose of this revision 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. 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 renumbers all of the subelements on this task to identify that the support being provided to First Stage is Constellation work. The Subject Matter Expert (SME) support previously detailed in Subelement -03 has been deleted from this Task Order Plan (TOP) This SME support is now being provided to the First Stage Office via another MSFC contract vehicle. This revision increases the scope of this Task Order to include Operations and Ground Test Project Engineering support, Subelement –CC., which was previously included in Task Order 32-060303.

Previous Subelement Number	New Subelement Number	Type of Support
-00	-CA	Project Management Technical Coordination Support
-01	Deleted in this revision	Provided Via Another MSFC Contract Vehicle
-02	-CB	Project Engineering And Data Requirement Development
New	-CC	Ground Operations And Test Project Engineering
-03	-CD	SME Requirement Definition And Development, Planning
-04	-CE	SME Parachute Analysis Of The Aerodynamics And Flight Mechanic Support

Revision 02: This revision modifies the three (3) open subelements and adds two (2) new subelements to this Task Order Plan (TOP) to better meet the First Stage Element Office's needs. The overall cost impact resulting from this revision is a decrease of (b)(4)

- Subelement -00: The ODC Cost Estimate was reduced (b)(4) to more accurately align the estimated ODC cost incurred in FY06 for the project management technical coordination support with the FY06 ODC billing period.
- Subelement -01: The ODC Cost Estimate was reduced (b)(4) because less RSRM technical analysis was needed than initially estimated.
- Subelement -02: The Labor Estimate was increased (b)(4) because more data requirement development support was needed than initially estimated. The Travel Estimate was reduced (b)(4) because the trip initially estimated for the 4th quarter of this year will not be necessary. The total decrease to the subelement estimate was (b)(4)
- Subelement -03: The Labor Estimate is (b)(4) for oversight of the Subject Matter Expert (SME) support for requirement definition specifically related to past Saturn and Apollo programs. The ODC Cost Estimate for this subelement will be included in the FY07 Task Order revision.
- Subelement -04: The Labor Estimate is (b)(4) for oversight of the Subject Matter Expert (SME) support for aerodynamics and flight mechanics analyses of the FS parachute systems and parachute separation systems requirement definition. The ODC Cost Estimate for this subelement will be included in the FY07 Task Order revision.

Revision 01: This revision updates two (2) of the subelements on this Task Order Plan (TOP) to better meet the First Stage Element Office's needs. The overall cost impact resulting from this revision is an increase of (b)(4)

- Subelement -00: This revision increases the scope of this subelement to add additional project management technical coordination support. The total increase to the subelement estimated cost is (b)(4)
- Subelement -02: This revision includes a decrease in the travel budget for this subelement to better reflect the actual task support needs. The total decrease to the subelement estimated cost is (b)(4)

Revision 00: This is a Task Order (TO) on the NNM05AB50C ESTS Contract to provide work to the CLV First Stage Element Office and it defines and estimates work for the period 1 April 2006 through 29 September 2006. Funding for this task is provided per MSFC PR number 4200160070.

1.0 Task Order Description & Objectives

This task order includes the following subelements:

- Subelement -CA includes project management technical coordination support, including development of presentations, routing, tracking and coordinating closure of action items, management of information flow internal and external to the First Stage Element Office, and overall coordination of the element's activities internal external to the element. Provide meeting supplies and support for major FS project reviews. (WBS 136905.08.01.01) ***Closed in Revision 21.***
- Subelement -CC includes serving as the lead for the SE&I ground operations and test activities associated with the First Stage Element to include prime contractor facilities and the launch site. Provide oversight for prime contractor activities to include data deliverables. (WBS 136905.08.01.04) ***Closed in Revision 21.***
- Subelement -CD SME support includes assisting with FS project planning, requirement definition and development, planning for the Ares I-X test flight effort, and the initial evaluation of critical functional elements of the new CLV, drawing on past Apollo and Saturn V experience. (WBS 136905.08.01.09) ***Closed in Revision 21.***
- Subelement -CE includes SME support to perform analysis of the aerodynamics and flight mechanics of the Ares I-X First Stage to assist in the design, development, planning, and testing of the Ares I-X FS parachute system. (WBS 136905.08.01.02.01.08) ***Closed in Revision 21.***
- Subelement -CF includes Thrust Vector Control and Avionics support to the First Stage Avionics and Control Team. (WBS 136905.08.01.02.01, WBS 136905.08.01.03) ***Closed in Revision 21.***
- Subelement -CG includes serving as the First Stage lead for Systems and Documentation Requirements in support of the Ares I-X test flight effort. (WBS 136905.08.01.19.01) ***Closed in Revision 21.***
- Subelement -CH includes integration services supporting Ares First Stage project activities including retrieval, analysis, and communication of project information, support for earned value or performance management initiatives, and project scheduling. (WBS 136905.08.01.01) ***Closed in Revision 21.***
- Subelement -CI includes assisting with FS project planning and scheduling, as well as requirement definition and development, including planning for the Ares I-X test flight effort and subsequent ground and flight tests associated with critical functions of the Ares I vehicle, drawing on past Apollo, Saturn and Shuttle experience. (WBS 136905.08.01.09) ***Closed in Revision 21.***

- Subelement -O1 ***Closed in Revision 20..***
- Subelement -05 (WAS Subelement -O1) includes Thrust Vector Control and Avionics support to the Shuttle RSRM Office through the First Stage Element Office Project Manager. (WBS 522632.08.01.01) ***Closed in Revision 21.***
- Subelement –SA (WAS Subelement -05) includes Thrust Vector Control and Avionics support to the Shuttle RSRM Office through the First Stage Element Office Project Manager. (WBS 522632.08.01.01)
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2.0 Technical Approach (Including required input, guidelines & assumptions)

Subelement -CA: ***Closed in Revision 21.***Project Management/Technical Coordination support includes the following:

1) Support the customer in the development of technical and programmatic presentations.
    a. Utilize data from existing presentations.
    b. Obtain data as required from research, First Stage Element team members and prime contractor.
    c. Coordinate with the graphics support personnel.
    d. Coordinate and review presentations with the First Stage Element Office.
2) Responsible for facilitating the closure of actions received by First Stage Element Office from the Project Office, MSFC, HQ and other sources:
    a. Route actions to the appropriate First Stage Element actionee.
    b. Track all First Stage Element actions to maintain status and ensure on-time closure.
    c. Take the lead to resolve issues that are delaying the closure of actions.
3) Facilitate and manage the flow of information internal and external to the First Stage Element Office.
    a. Provide weekly notes to the CLV Project Office from the First Stage Element Office, gathering information from the appropriate First Stage Element team members.
    b. Coordinate submission of the monthly Program Management Council (PMC) charts to the CLV Project Office.
    c. Handle other communication flow as required.
4) Provide overall coordination of the element's activities internal and external to the element.
    a. Organize special on-site and off-site meetings as required.
    b. Ensure the appropriate facilities and equipment is available.
    c. Develop and communicate the agenda with internal and external attendees to ensure proper level of preparedness for a successful meeting.
    d. Represent the Project Office in support of the First Stage Avionics and Control Team.
5) Perform other coordination functions for the customer as needed in order to successfully conduct daily business.

Subelement -CC: ***Closed in Revision 21.***The Operations and Ground Test Project Engineering personnel will provide support for the First Stage Element Office Systems Engineering and Integration (SE&I) team. This support includes coordination and interface with Crew Launch Vehicle Project office, engineering, contractors, CLV Elements, CLV Vehicle Integration office, and other NASA centers is required to ensure the First Stage Element successfully meets the CDR, test, and mission objectives. Efforts may include the following:

- Providing input to the CLV Operations Concept;
- Formulating requirements;
- Coordinating review of contractor deliverables;
- Supporting testing activities as required;
- Developing element schedules;

- Coordinating meetings;
- Tracking element tasks to completion;
- Assessing test schedules;
- Assessing mission objectives;
- Participating in major milestone reviews;
- Assisting in the generation of an assortment of engineering and element reports for internal and external dissemination;
- Interacting with multiple engineering disciplines, processes, and integrated product teams.

Subelement -CD: ***Closed in Revision 21.*** The duties of the Subject Matter Expert (SME) personnel will include advising the element leadership regarding Ares I-X FS design, verification, and integration requirement definition and development, attending and participating in program reviews, and contributing to the overall CLV and FS mission planning efforts. The subcontractor shall review technical reports, requirements documents, and engineering memorandums for technical adequacy and content. The subcontractor shall prepare and deliver technical and programmatic briefings as requested.

The contractor shall provide expertise in the following specific areas:

- First Stage Requirements Development
- First Stage Mission Planning
- First Stage Interface Verification and Integration
- First Stage Flight Execution

This effort is concluded in December, 2009, with Revision 18.

Subelement -CE: ***Closed in Revision 21.***The duties of the Subject Matter Expert (SME) personnel will include performing analyses of the aerodynamics and flight mechanics CLV First Stage to support the design, development, planning, and testing of the FS parachute system for the Ares I-X test flight effort as well as the CLV. The subcontractor will participate in program reviews, preparing comments and recommendations on technical approaches, and participating in the selection and implementation of design and technical approaches to meet baseline architectures and plans. The subcontractor shall review technical reports, requirements documents, and engineering memorandums for technical adequacy and content. The subcontractor shall prepare and deliver technical and programmatic briefings as requested.
The contractor shall provide expertise in the following specific areas:

- First Stage Separation System Development
- First Stage Recovery System Development
- First Stage Aerodynamics Analysis
- Analysis of the Flight Mechanics of the First Stage Parachute System

Subelement -CF: ***Closed in Revision 21.***The Thrust Vector Control personnel will provide support for the First Stage Element Office Avionics and Control Team. This support may include coordination and interface with Ares I Project office, engineering, contractors, Ares I Elements, Ares I Vehicle Integration office, and other NASA centers to ensure the First Stage Element successfully meets the CDR, test, and mission objectives. Personnel, including subcontractors, will participate as requested in program reviews, preparing comments and recommendations on technical approaches, and participating in the selection and implementation of design and technical approaches to meet baseline architectures and plans. Personnel will review technical reports, requirements documents, and engineering memorandums for technical adequacy and content. Personnel will prepare and deliver technical and programmatic briefings as requested.

In addition, the subcontractor providing technical Thrust Vector Control support shall provide expertise in the following specific areas:

- Detailed expertise and knowledge resulting from experience from the development of the Space Shuttle Solid Rocket Booster Thrust Vector Control systems for the Solid Rocket Motor.

- Support all phases of design, development and test activities of the Ares I First Stage Thrust Vector Control System.
- Provide expertise of the Thrust Vector Control system to identify and determine potential integration issues.
- Identify technical and programmatic risks/issues while recommending mitigation solutions as well as verification and validation approaches.

Subelement -CG: ***Closed in Revision 21.***Systems and Documentation Requirements Lead support includes the following:

- System and Element verification planning.
- Distribution of Ares I-X Systems Engineering and Integration documentation.
- Organization of First Stage hardware transportation from vendors.
- Tracking of design models and drawings between vendors and to the government customer.
- Meeting logistics Integrated Product Team lead.
- Assist in the selection and implementation of design and technical approaches to meet First Stage baseline architecture.
- Attend First Stage Technical Reviews as required.
- Assist in Weekly and Monthly Status Report preparation.
- Thorough knowledge of WebEx, Windchill and PBMA.
- Familiarity with Constellation, Ares and First Stage Programs/Projects.

Subelement -CH: ***Closed in Revision 21.***First Stage Element Office Support includes integrating and analyzing earned value information both independently, and in a teaming environment. Specific duties include researching, integrating, and disseminating programmatic performance information for technical and non-technical audiences; supporting project activities, including retrieval, analysis, and reporting of information; supporting project reviews and reports; developing documentation, controls, and tracking mechanisms of First Stage milestones, planning, and schedules as needed; ensuring that both in-house and prime contractor performance is measured in keeping with NASA's overall performance management plan. The contractor will provide leadership and support to project management and peers throughout the Ares I First Stage project.

Subelement -CI: ***Closed in Revision 21.*** Project Planning and Scheduling Support will include attending program reviews, preparing comments and recommendations on technical approaches, and participating in the selection and implementation of design and technical approaches to meet baseline architectures and plans. The contractor will review technical reports, requirements documents and engineering memorandums for technical adequacy and content. The contractor will prepare and deliver technical and programmatic briefings as required.

The contractor will provide expertise in the following specific areas:

- First Stage Requirements Development
- Mission Planning and Implementation
- Stage Interface Integration and Verification
- Flight and Test Execution
- Ground Testing and Execution

Subelement -05: ***Closed in Revision 21.*** (WAS Subelement -O1) Thrust Vector Control and Avionics Subcontractor personnel will provide expertise to assist and support the Shuttle RSRM Office, including expertise in the design, development, test and integration of TVC systems and Avionics. Representative support will include:

- Detailed expertise and knowledge resulting from trade studies, concepts, requirements, systems engineering, program cost/schedules, application of complex aerospace technologies and lessons learned from the development of the Space Shuttle Solid Rocket Booster (SRB) systems for the Solid Rocket Motor (SRM).

- Support of all phases of design, development and test activities of TVC and Avionics systems as well as the successful integration of associated electronic components, and support of analysis and assessment of subsystem components for standalone system verification and fault isolation through the use of test tools and simulations.
- Providing expertise as required to identify and determine potential integration issues through various upgrades to the architecture to support the Shuttle program.
- Identification of technical and programmatic risks/issues while recommending mitigation solutions as well as verification and validation approaches for complex aerospace systems. Personnel will utilize various models and simulations (M&S) toolsets to support the characterization of the ascent environment to ensure adequate design for the aerospace loading of subsystems as required.
- Providing briefings, review of reports/technical documents, and attending program reviews as requested by the Government customer.

Subelement -SA: (WAS Subelement -05) Thrust Vector Control and Avionics Subcontractor personnel will provide expertise to assist and support the Shuttle RSRM Office, including expertise in the design, development, test and integration of TVC systems and Avionics. Representative support will include:

- Detailed expertise and knowledge resulting from trade studies, concepts, requirements, systems engineering, program cost/schedules, application of complex aerospace technologies and lessons learned from the development of the Space Shuttle Solid Rocket Booster (SRB) systems for the Solid Rocket Motor (SRM).
- Support of all phases of design, development and test activities of TVC and Avionics systems as well as the successful integration of associated electronic components, and support of analysis and assessment of subsystem components for standalone system verification and fault isolation through the use of test tools and simulations.
- Providing expertise as required to identify and determine potential integration issues through various upgrades to the architecture to support the Shuttle program.
- Identification of technical and programmatic risks/issues while recommending mitigation solutions as well as verification and validation approaches for complex aerospace systems. Personnel will utilize various models and simulations (M&S) toolsets to support the characterization of the ascent environment to ensure adequate design for the aerospace loading of subsystems as required.
- Providing briefings, review of reports/technical documents, and attending program reviews as requested by the Government customer.

3.0 Discussion of Skills Required

Project Management Technical Coordination Support (Subelement -CA) - *Closed in Revision 21.* This task requires excellent writing, communication, and analytical skills. Personnel should have extensive engineering knowledge of system requirements development, and integration. Personnel shall also be experienced in database management, project planning, and project management. Personnel shall have access to and experience with tools accessible on the Integrated Collaborative Environment (ICE) portal. Personnel should possess a proficiency in Microsoft Office tools (MS Project, Word, Excel, PowerPoint, Project, Access and Filemaker Pro); and a working knowledge of NASA documentation (NPR 7120.5, etc.).

Operations & Ground Test Project Engineering Support: (Subelement -CC) - *Closed in Revision 21.* The Project Engineering Operations and Ground Test personnel supporting this task need to have (b)(4) (b)(4) The task personnel should also have excellent knowledge of NASA and/or DoD processes and procedures.

Subject Matter Expert (SME) Requirement Definition Support (Subelement -CD) - *Closed in Revision 21.* This task requires a minimum of (b)(4) (b)(4) Subcontractor shall provide personnel who are experienced and highly qualified in launch vehicle design, requirement definition, and interface verification and integration. This effort is concluded in December, 2009, with Revision 18.

Subject Matter Expert (SME) Parachute Systems Support (Subelement -CE) - *Closed in Revision 21.* This task requires a (b)(4) (b)(4) Subcontractor shall provide personnel who are experienced and highly qualified in the development and testing of parachute systems as well as the separation and recovery of flight hardware.

Thrust Vector Control Support (Subelement -CF) - *Closed in Revision 21.* Avionics and Control Team support shall have (b)(4) (b)(4) Subcontractor providing technical Thrust Vector Control system expertise shall provide personnel with a (b)(4) (b)(4)

Systems and Documentation Requirements Support (Subelement -CG) - *Closed in Revision 21.* Systems and Documentation Requirements Lead shall have (b)(4) (b)(4) (b)(4) A thorough knowledge of WebEx, Windchill, and PBMA is required. Familiarity with Constellation, Ares, and First Stage Programs/Projects is also required. Knowledge of spaceflight hardware processing flow through Kennedy Space Center (KSC) is highly desired. Thorough knowledge of all Microsoft Office products (Word, Excel, Outlook, and Powerpoint) is also required. Familiarity with Microsoft Project is desired.

First Stage Element Office Support (Subelement -CH) - *Closed in Revision 21.* Individual should have a (b)(4) (b)(4) (b)(4) Familiarity with NASA policies, procedures and processes is highly desirable. Personnel shall be proficient in Microsoft Word, PowerPoint, Excel, and Outlook.

Project Planning and Scheduling (Subelement -CI) - *Closed in Revision 21.* Contractor personnel shall have a (b)(4) (b)(4) Personnel shall also be experienced and highly qualified in launch vehicle design, requirements definition, ground and system testing, interface verification, system integration, and test and checkout.

Thrust Vector Control and Avionics Support to RSRM (Subelement -05) - *Closed in Revision 21.* (WAS Subelement -O1) Contractor personnel shall have a (b)(4) (b)(4) (b)(4) Excellent written and verbal communication skills are required. Personnel are required to be self-motivated team players familiar with working in a dynamic work environment.

Thrust Vector Control and Avionics Support to RSRM (Subelement -SA) - (WAS Subelement -05) Contractor personnel shall have a (b)(4) (b)(4) (b)(4) Excellent written and verbal communication skills are required. Personnel are required to be self-motivated team players familiar with working in a dynamic work environment.

4.0 Special Tools Required

None identified.

5.0 Participating Subcontractors

(b)(4)

6.0 Milestones & Deliverables

Monthly Activity Reports
Project/Element products (presentations, reports, plans, etc.)
Quarterly First Stage Earned Value Management assessment package

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

Subelement -CA: ***Closed in Revision 21.***The Travel estimate is based on two (2) trips in CY05, to support the First Stage Project Office at major milestone reviews, Technical Interchange Meetings (TIMs) or offsite meetings as required, and one (1) trip in CY05 to attend a class on Solid Rocket Motors (SRMs). (b)(4)

(b)(4)

Subelement -CC: ***Closed in Revision 21.***The Travel estimate is based on fourteen (14) trips in CY05 in support of the First Stage Project Office as the Operations and Logistics Lead to various major milestone reviews, TIMs and face-to-face working group meetings, and one (1) trip in CY05 to attend a class on SRMs. Travel may include trips to the Prime Contractor location in Utah, Kennedy Space

Center in Cape Canaveral, Florida, Johnson Space Center in Houston, Texas, and Michoud Assembly Facility (MAF) in New Orleans, Louisiana. (b)(4) (b)(4)

Subelement -CF: ***Closed in Revision 21.***The Travel estimate is based on four (4) trips in CY05 in support of various milestone reviews, TIMs and face-to-face working group meetings, and one (1) trip for each of two (2) employees in CY05 to attend a class on SRMs. Travel may include trips to several locations across the country, including the Prime Contractor location in Utah and Kennedy Space Center in Cape Canaveral, Florida. (b)(4) (b)(4)

Subelement -CG: ***Closed in Revision 21.*** (b)(4) (b)(4)

Subelement -CH: ***Closed in Revision 21*** (b)(4) (b)(4)

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
TBD	None identified at this time		

9.0 Schedule

Task Order #	Subelement	Task Work Element	FY2011												
			Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
45-020001	SA	**First Stage Element Support**													
45-020001	SA	Thrust Vector Control and Avionics Support to RSRM													

ESTS Contract Task Order Request Performance Plan

Task Order Title: First Stage Office

Task Order Number: 45-020001 Revision: 21

Category	Weighting Technical %	End of Period Technical Score
	65%	X 65% =
Technical Objectives		**Justification**
1)Support the customer by providing expertise in the design, development, test and integration of TVC systems and avionics. Assist in the development of technical and programmatic presentations.		
	Weighting Schedule %	**Schedule Score**
	10%	X 10% =
Schedule Objectives (Milestones)	*(min 10%)*	**Justification**
1) Monthly Reports 2)Project/Element products (presentations, reports, plans, etc.)		
	Weighting Cost%	**Cost Score**
	25%	X 25% =
Cost (actual vs. negotiated)	*(min.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

ESTS Contract Task Order Request Performance Plan

Task Order Number: First Stage Office

Task Order Number: 45-020001 Revision: 21

Comments:

Marshall Space Flight Center
Engineering, Science & Technical Services

JACOBS ESTS Group

Risk Assessment

Contract Number: *NNM05AB50C*
TO Title: *First Stage Office*
TO Number: *45-020001* **Revision:** *21*

Period of Performance: *10/02/2010* to *3/31/2011*

MSFC Initiator: *Janet Crawford*

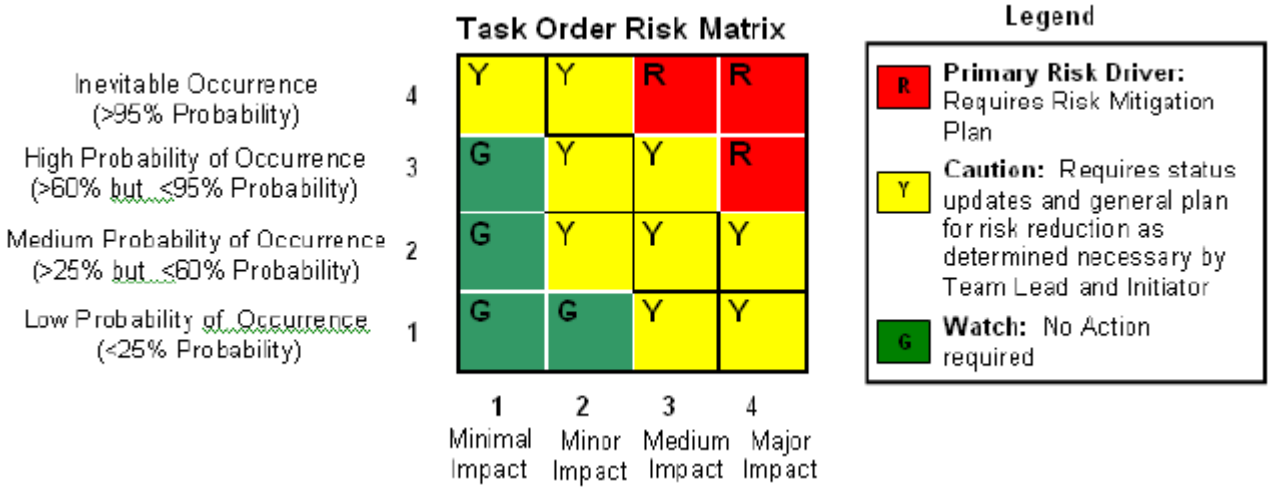
(b)(4)

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			None identified
Risk C2	Cost			
Risk T1	Technical			None identified
Risk T2	Technical			
Risk S1	Schedule			None identified
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