

**Task Order Plan (TOP)**

**Contract Number:** NNM05AB50C  
**TO Title:** Software Development Branch  
**TO Number:** 37-050201 **Revision:** 11

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**Period of Performance:** 10/02/2010 to 9/30/2011

**MSFC Initiator:** Terry Brown

(b)(4)

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**Emergency:** No

**Revision 11:**

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 the programs listed in the table below:

Subelement	Previous Subelement	WBS	Program
JA	02	401769.06.03.03.02.07	ISS
SA	00	522094.08.01.01.01	Shuttle

The subelements have been renamed to conform to the project/program naming convention that has been established for FY11.

**Revision 10:**

This Task Order Plan revision incorporates the following changes required to the level of support necessary to accomplish the objectives of the task order.

Subelement 02 planned labor was increased by (b)(4) hours due to an increase in scope of additional maintenance of UPA software products. The travel estimate was removed because no travel is anticipated.

Subelement CD has been administratively closed.

Subelement CE has been administratively closed and the work corresponding to this is being continued under the new TO # 37-000001 Subelement CO.

**Revision 09:**

This Task Order Plan revision incorporates the following changes required to the level of support necessary to accomplish the objectives of the task order.

Subelement CE : The Labor estimate was reduced by (b)(4) hours to reflect a reduction in scope of Vehicle System Management (VSM) requirements due to a resignation. Due to Ares uncertainties, the customer has directed positions not be backfilled after resignations. The Travel estimate was reduced by (b)(4) and the ODC was reduced by (b)(4) to reflect this reduction in scope.

This revision affects APO element Vehicle Integration.

**Revision 08:**

This Task Order Plan revision incorporates the following changes required to the level of support necessary to accomplish the objectives of the task order.

Subelement –02

- Planned labor was increased by (b)(4) hours due to an increase in scope for the development and support for Urine Processor Assembly (UPA) software version 6.0 work products. In addition, the labor estimated is increased to support additional maintenance of UPA software products.

This revision does not affect any APO element.

Subelement / WBS funding matrix

Subelement	WBS
CD	136905.08.01.03
CE	136905.02.06.08.03
00	522094.08.01.01.01
02	401769.06.03.03.02.07

**Revision 07:**

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 following APO elements: Vehicle Integration and First Stage.

Subelement / WBS funding matrix

Subelement	WBS
CD	136905.08.01.03
CE	136905.02.06.08.03
00	522094.08.01.01.01
02	401769.06.03.03.02.07

**Revision 06:**

This Task Order Plan revision incorporates the following changes required to the level of support necessary to accomplish the objectives of the task order.

Subelement –00

- Planned labor was increased by (b)(4) hours.
- Planned travel estimate was removed since no future travel is anticipated in support of this subelement.

Subelement –02

- Planned labor was increased by (b)(4) hours.

Subelement –03

- Planned labor was decreased by (b)(4) hours.

Subelement –CD

- Planned subcontractor support was decreased by (b)(4)
- Planned travel was decreased (b)(4)

Subelement –CE

- Planned labor was decreased by (b)(4) hours.
- Planned Other Direct Costs (ODC) were increased by (b)(4) for recruiting costs.
- Planned travel was decreased by (b)(4)

This revision affects APO element Vehicle Integration, Ares I First Stage, Space Shuttle, Urine Processor Assembly, and Next Generation Advanced Video Guidance Sensor Software products.

**Sub-element Mapping and WBS funding**

Subelement	WBS
CD	136905.08.01.03
CE	136905.02.06.08.03
00	522094.08.01.01.01
02	401769.06.03.03.02.07
03	644423.02.99.01.08

**Revision 05:**

This Task Order Plan revision incorporates the following changes required to the level of support necessary to accomplish the objectives of the task order.

Subelement –CE

- Planned level of support is decreased by (b)(4) hours of (b)(4) labor, decreased by (b)(4) hours of (b)(4) and decreased by (b)(4) labor to reflect effort required to accomplish the objectives of this subelement.

Subelement –03

- Planned level of subcontractor support is decreased by (b)(4) to reflect effort required to accomplish the reduced scope of this subelement.

This revision affects APO element Vehicle Integration and also affects Next Generation Advanced Video Guidance Sensor Software products.

Sub-element Mapping and WBS funding

Subelement	WBS
CD	136905.08.01.03
CE	136905.02.06.08.03
00	522094.08.01.01.01
02	401769.06.03.03.02.07
03	644423.02.99.01.08

**Revision 04:**

This Task Order (TO) is a continuation of work being performed on TO 37-050201 subelement CD, CE,00,02, and 03. This task order will extend work performed 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 APO elements Ares I 1<sup>st</sup> Stage and Vehicle Integration, This task order revision also closes subelement CA and CB.

Previous TO	New Task Order	WBS
37-050201-CA	37-050204-CA	136905.08.05.09.01.08
37-050201-CB	37-050204-CB	136905.08.05.09.01.08

Sub-element Mapping and WBS funding

Subelement	WBS
CD	136905.08.01.03
CE	136905.02.06.08.03
00	522094.08.01.01.01
02	401769.06.03.03.02.07
03	644423.02.99.01.08

**Revision 03:**

This Task Order Plan revision incorporates the following changes required to the level of support necessary to accomplish the objectives of the task order.

Subelement –CA

- Planned level of support changed to the level needed to accomplish the objectives of this subelement. Planned hours were increased by (b)(4)

Subelement –CD

- Planned level of Subcontractor support is increased to (b)(4) a level to support the objectives of this subelement.

Subelement –CE

- Planned level of Other Direct Costs (ODC) support increased by (b)(4) for this subelement. Scope was increased to support recruiting efforts.

Subelement –02

- Planned level of support changed to the level needed to accomplish the objectives of this subelement. Planned hours were increased by (b)(4)

Subelement –03

- Planned level of subcontractor support is increased to (b)(4) a level to support the objectives of this subelement.

**Revision 02:**

This Task Order Plan revision incorporates the following changes required to the level of support necessary to accomplish the objectives of the task order.

Subelement –CA

- Planned level of subcontract support reduced to the level needed to accomplish the objectives of this subelement.
- Planned level of support reduced for this subelement. Scope was decreased to reflect the removal of a planned support position.

Subelement –CE

- Planned level of support reduced to reflect later than planned start date of new hire.

Sub-element Mapping and WBS funding

New Subelement	Previous TO	WBS
CA	32-020201-CA	136905.08.05.09.01.08

CB	32-020201-CA	136905.08.05.09.01.08
CD	32-020201-CD	136905.08.01.03
CE	N/A	136905.02.06.08.03
00	31-030201-00	522094.08.01.01.01
02	31-030201-04	401769.06.03.03.02.07
03	31-030201-09	644423.02.99.01.08

**Revision 01:**

This Task Order Plan revision incorporates the following changes required to the level of support necessary to accomplish the objectives of the task order.

Subelement –02

- Planned level of support changed to the level needed to accomplish the objectives of this subelement. Planned hours were increased by (b)(4) hours of a (b)(4) and increased by (b)(4) of subcontractor support.

Subelement –CA

- Modified the schedule to reflect the move of the flight software Preliminary Design Review (PDR) from September 2008 to after the end of the period of performance of this Task Order.
- Scope of subcontracted work was increased by (b)(4) to reflect a new position.
- Scope was decreased by (b)(4) of hours to reflect start dates of new hires, the removal of a planned co-op student, reallocation of resources to support subelement CE, and to change level of subcontract support.

Subelement –CB

- Planned level of support changed to the level needed to accomplish the objectives of this subelement. Planned hours were decreased by (b)(4) hours.

Subelement –CD

- Added estimated travel of (b)(4) to support two trips.

Subelement –CE

- Added new subelement for Ares I Flight Software Design and Development Vehicle Integration Support (WBS 136905.02.06.08.03). Estimated level of support is (b)(4) hours of a senior engineer, and (b)(4) of subcontractor support.
- Added estimated travel of (b)(4) to support two trips.

**Revision 00:**

This Task Order (TO) is a continuation of work being performed on TO 31-030201 and 32-020201 of the NNM05AB50C ESTS contract. This TO realigns work performed previously in EI32 and EV22, and now supports ES52 within the new ED organizational structure. This TO defines and estimates work for the period 1 March 2008 through 26 September 2008. For Subcontracted efforts, this TO authorizes work for the same period. TO 31-030201 and TO 32-020201 will be revised for closure in March with an effective date of 29 February 2008.

Other adjustments:

Due to a change in scope, the following modifications were made to the current plan for Contract Year 3:

- (b)(4) personnel were added (b)(4), for a total of (b)(4) hours.
- Subcontractor labor for a total of (b)(4) was added.

**1.0 Task Order Description & Objectives**

**-JA, Urine Processor Assembly (UPA) Software Support**

This subelement provides software engineering support in the development of UPA software products during the software development lifecycle.

Typical work will include, but not be limited to the following:

- Producing software products
- Producing and updating software documentation
- Performing selected product evaluations
- Performing software technical assessments of flight software products
- Participating in software test activities

Support Software Systems activities such as:

- Metrics
- Methodologies
- Software processes

Support provided will also include supporting software and project reviews, working groups, software peer reviews, teleconferences, meetings and walkthroughs.

### **-SA, Space Shuttle Main Engine (SSME) Controller Software Support**

This subelement provides support for the SSME controller flight software project.

Typical work will include, but not be limited to the following:

- Review of all software related documentation and planning schedules.
- Review of SSME operational software builds.
- Resolution and implementation of software issues and changes.
- Coordination with the SSME Project Office, prime contractor and field sites.
- Serve as the MSFC point of contact for the Level II Shuttle Avionics Software Change Board (SASCB).

Support provided will also include conducting software audits, attendance at SSME Change Control Board (CCB) and Material Review Board (MRB) meetings, avionics team and project team meetings, software teleconferences, and software Technical Interchange Meetings (TIM).

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

### **[Applies to all subelements]**

The ESTS Group will perform the work described above using standard office automation software including Microsoft Project, Excel, and Word.

To perform this work, the ESTS Group will provide technical evaluations of software documentation for adequate definition of the avionics system and software requirements, provide inputs to documentation, provide book management support as necessary, provide inputs to trade studies for the system hardware & software, apply lessons learned from previous avionics and software development experience in justification of requirements additions and changes. Software maintenance activities

The ESTS Group will support meetings, Project reviews, team & staff meetings, attend tests, and TIM as necessary to fulfill the responsibilities of this task.

### **[Applies to subelement -JA, Urine Processor Assembly (UPA) Software Support]**

The work will be performed in accordance with NASA EI32-OI-001 Software Development Process Description Document (SDPDD) to comply with the Capability Maturity Model Integrated (CMMI) requirements.

### 3.0 Discussion of Skills Required

**[Applies to all subelements]**

Personnel performing this subelement of this Task must be proficient with the software processes and tools listed above. Senior support personnel must (b)(4)

(b)(4)

**[Applies to subelement -JA, Urine Processor Assembly (UPA) Software Support]**

Personnel must possess embedded flight software experience, with subject matter expertise in UPA flight software highly desirable. Experience in C language programming is required.

**[Applies to subelement -SA, Space Shuttle Main Engine (SSME) Controller Software Support]**

Senior personnel must possess subject matter expertise in SSME Controller flight software, including Block II Controller requirements and design and Advanced Health Management System (AHMS).

### 4.0 Special Tools Required

No special tools have been identified to support this task.

### 5.0 Participating Subcontractors

None.

### 6.0 Milestones & Deliverables

**[Applies to all subelements]**

Deliverables for this task are: Monthly Activity Reports (MAR), trip/travel reports where major activities significant to this task were performed, presentation charts given by personnel supporting this subelement, document evaluations with significant programmatic impact, and software source and executable code.

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

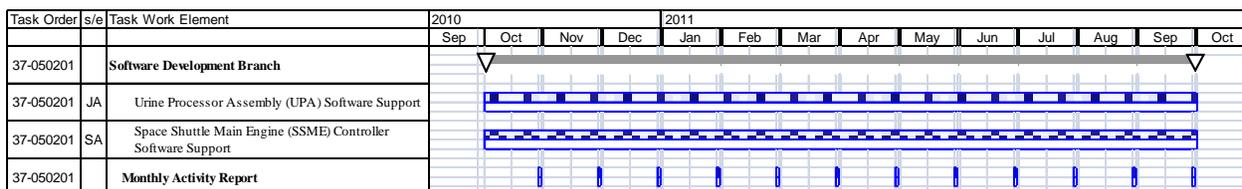
None.

### 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
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### 9.0 Schedule



# ESTS Contract Task Order Request Performance Plan

Task Order Title: [Software Development Branch](#)

Task Order Number: [37-050201](#) Revision: 11

Category	Weighting Technical %	End of Period Technical Score
<b>Technical Objectives</b>	65%	X <u>65%</u> = <b>Justification</b>
<ul style="list-style-type: none"> <li>-Support integration of FSW, and other sub-elements as requested</li> <li>-Support FSW task: planning; system documentation analysis; detailed FSW requirements and design documentation development</li> <li>-Support schedule development, action tracking/status, risk management as requested in support of FSW Project Management functions</li> </ul>		
<b>Schedule Objectives (Milestones)</b>	<b>Weighting Schedule %</b> <u>10%</u> <i>(min 10%)</i>	<b>Schedule Score</b> X <u>10%</u> = <b>Justification</b>
<ul style="list-style-type: none"> <li>-Monthly status reports</li> <li>-Activities in support of FSW project milestones</li> <li>-Provide weekly status as requested</li> </ul>		
<b><u>Cost (actual vs. negotiated)</u></b>	<b>Weighting Cost%</b> <u>25%</u> <i>(min.25%)</i>	<b>Cost Score</b> X <u>25%</u> = <b>Justification</b>
	<b>Weighting Total %</b> <u>100.00%</u>	<b>Total Score</b>

# ESTS Contract Task Order Request Performance Plan

Task Order Title: [Software Development Branch](#)

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## 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: [Software Development Branch](#)

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**Comments:**

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**Risk Assessment**

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**MSFC Initiator:** Terry Brown

(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.
Risk T1	Technical	1	4	Technical performance may be adversely impacted or delayed if key resources become unavailable given that there is no backup for these resources.
Risk S1	Schedule	1	2	Schedule is dependent on input data availability. Delayed access to necessary input data may adversely impact schedule.

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

