Marshall Space Flight Center
Engineering, Science & Technical Services

JACOBS ESTS Group

Task Order Plan (TOP)

Contract Number: *NNM05AB50C*
TO Title: *Optical Laboratory Equipment and Testing*
TO Number: *43-060301* **Revision:** *11*

Period of Performance: *10/02/2010* to *09/30/2011*

MSFC Initiator: *Jeff Kegley*

(b)(4)

Emergency: *No*

Revision 11: The purpose of this revision (11) 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. Subelement -01 has been renumbered to –RA to conform to the project/program naming convention that has been established for FY11. This revision affects support to the James Webb Space Telescope (JWST) primary mirror segment testing activities.

Sub-elements and WBS funding:

Program	Subelement	Previous Subelement	WBS	Status
JWST	RA	01	411672.06.04.01	Mapped to 43-060301-RA

Revision 10: The purpose of this revision (10) 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. Funding for this task is provided per WBS: 411672.06.04.01. 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 testing of the James Webb Space telescope primary mirror segments.

Revision 09: The purpose of this revision (09) 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. Funding for this task is provided per WBS: 411672.06.04.01. Additionally, the Schedule, Performance Plan and Risk Assessment have been revised to reflect changes in task activities for the new period of performance. Also, the designation of Subelement -01 has officially changed to X-ray and Cryogenic Facility Support from X-ray Calibration Facility Support.

The purpose of revision (08) is to close out the task work, labor & material estimate, and funding on Subelement -00 and -02 as of February 29, 2008 due to the ED organizational restructure from VP63 to ES31. Task support on task order (TO) 43-060301-00 will be continued on TO 37-030101-00 in the ES31 directorate effective March 01, 2008. Subelement -01 (X-ray Calibration Facility Support) will remain under this TO. There will be no continuing task support on Subelement -02 by the request of

the customer. Work performed on this TO will migrate to new task orders in accordance with the mapping shown below:

Existing TO/Subelement	New TO/Subelement
43-060301-00	37-030101-00
43-060301-01	N/A
43-060301-02	Closed

The purpose of revision (07) 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 26 September 2008. Funding for this task is provided per MSFC PR# 4200212066 on Sub-element:00 and PR# 4200194730 on Sub-element: 01. Also, this revision defines the Work Capture and Proposal Support (Sub-Element: 02) during CY3. 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 (06) adjusts the material and ODC costs on the Sub-element: 00 (Space Optics Manufacturing Technology Center Support) to account for recent procurements requested by the customer. The subcontract labor estimates have increased on Sub-element: 00 to provide engineering project support as requested by the customer. Also, the subcontract labor estimates on the Sub-element: 01 (X-ray Calibration Facility Support) have been decreased to meet and reflect the customer's current task requirements.

This revision (05) adjusts the estimated labor hours on the Sub-element: 00 (Space Optics Manufacturing Technology Center Support) to hire a (b)(4) to support mirror shell replications. Also, travel costs have been added to Subelement: 00 to provide engineering support on the Kepler mirror effort as requested by the customer.

This revision (04) expands the scope of Sub-element:01 (X-ray Calibration Facility Support) to include risk and schedule assessment support and the internship of one summer student. The labor estimate increases to meet the customer's task requirements.

The purpose of this revision (03) is to define and estimate the X-ray Calibration Facility Support (Sub-Element: 01) during CY2. Additionally, the Schedule, Performance Plan and Risk Assessment have been revised to reflect the task activities for Sub-Element: 01.

The purpose of this revision (02) is to extend this task into Contract Year 2 (CY2) 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.

Task Order Revision (01) adjusts the labor and material estimate needed to meet the customer's task requirements. The labor estimate has decreased for the following reasons:

(b)(4)

Also, revision (01) breaks the task into two sub-elements to separate the Space Optics Manufacturing Technology Center (SOMTC) support and the X-ray Calibration Facility support.

This Task Order (TO) replaces TO 04-030201 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# 4200137676. 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

Sub-Element: RA (X-ray and Cryogenic Facility Support)

Technical support is required for the X-ray and Cryogenic Facility (XRCF). It requires the setup and maintenance of large and small vacuum chambers, equipment, and components. This task also provides the fabrication and integration of mechanical and handling fixtures/components needed to test optical systems in a high vacuum environment.

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

In order to successfully complete this task the following technical approach will be taken:

Sub-Element: RA (X-ray and Cryogenic Facility Support)

1) Fabrication, cleaning, integration, and installation of special test equipment (STE) in support of cryogenic optical testing at the XRCF. This STE will include items such as optical system support stands and translation stages, precision alignment devices, helium-cooled enclosures, and optical instrumentation access platforms. Activities require competency with conventional machine shop tools and must follow standard vacuum/cryogenic practice and the cleanliness guidelines of the XRCF.
2) Perform maintenance and repair of XRCF systems including cryogenic vacuum pumps, liquid nitrogen vacuum-jacketed lines and pumps, vacuum-compatible precision motion tables, and Claude-cycle helium refrigerators and compressors.
3) Perform standard XRCF reconfigurations associated with the chamber dome, the rail bridge systems, the helium-cooled enclosures, the test benches, the x-ray detector systems, and the guide tube.
4) Support flight hardware handling activities from the unloading area to the vacuum chamber. These activities dictate the understanding and strict adherence to pre-approved procedures and may involve forklift, crane, and unloading platform operations.
5) Follow proper clean room procedures to successfully complete activities in a Class 1000 environment.
6) Perform mass spectrometer helium leak detection operations associated with all XRCF vacuum chambers, cryogenic systems, and fluid/gas systems.
7) Support the 24-hours/day operation of the XRCF (including the large chamber, the small preconditioning chamber, the small cryogenic chamber, and the contamination monitoring chamber) by performing operational sequences and field surveillance activities to achieve test objectives.
8) Items 1-7 require extensive experience and on-the-job-training at the XRCF or similar test facility.

3.0 Discussion of Skills Required

Sub-Element: RA (X-ray and Cryogenic Facility Support)

Senior level paraprofessionals or technicians with skills and experience in the operation of lathes, drill presses, end mills, welding equipment, vacuum pumps, mass spectrometer leak detection instruments and other XRCF, machine shop, and fabrication tools.

4.0 Special Tools Required

None identified.

5.0 Participating Subcontractors

(b)(4)

6.0 Milestones & Deliverables

Sub-Element: RA (X-ray and Cryogenic Facility Support)

a. Monthly activity reports summarizing the activities for the reporting period for each calendar month.
b. Verbal or written progress reports.
c. Finished fabricated products.

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

None identified.

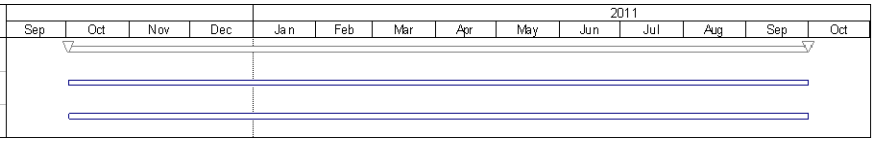
8.0 Work Shelf

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

TO/Subelement	Description	Due Date	Skill

9.0 Schedule

Task Order #	Subelement	Task Work Element
43-060301	--	**Optical Laboratory Equipment and Testing**
43-060301	RA	X-ray and Cryogenic Facility
43-060301	--	Monthly Activity Reports (MARs)



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Category	Weighting Technical %	End of Period Technical Score
	65%	X 65% =
Technical Objectives		**Justification**
Sub-Element: RA (X-ray & Cryogenic Facility Support) 1. Fabrication, cleaning, integration, and installation of special test equipment (STE) in support of cryogenic optical testing at the XRCF. This STE will include items such as optical system support stands and translation stages, precision alignment devices, he-lium-cooled enclosures, and optical instrumentation access platforms. Activities require competency with conventional machine shop tools and must follow standard vacuum/cryogenic practice and the cleanliness guidelines of the XRCF. 2. Perform maintenance and repair of XRCF systems including cryogenic vacuum pumps, liquid nitrogen vacuum-jacketed lines and pumps, vacuum-compatible precision motion tables, and Claude-cycle helium refrigerators and compressors. 3. Perform standard XRCF reconfigurations associated with the chamber dome, the rail bridge systems, the helium-cooled enclosures, the test benches, the x-ray detector sys-tems, and the guide tube. 4. Support flight hardware handling activities from the unloading area to the vacuum chamber. These activities dictate the understanding and strict adherence to pre-approved procedures and may involve forklift, crane, and unloading platform operations. 5. Follow proper clean room procedures to successfully complete activities in a Class 1000 environment. 6. Perform mass spectrometer helium leak detection operations		

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associated with all XRCF vacuum chambers, cryogenic systems, and fluid/gas systems. 7. Support the 24-hours/day operation of the XRCF (including the large chamber, the small pre-conditioning chamber, the small cryogenic chamber, and the contamination monitor-ing chamber) by performing operational sequences and field surveillance activities to achieve test objectives.		
Schedule Objectives (Milestones)	**Weighting Schedule %** 10% *(min 10%)*	**Schedule Score** X 10% = **Justification**
Sub-Element: RA (X-ray & Cryogenic Facility Support) 1. Monthly activity reports summarizing the activities for the reporting period for each cal-endar month 2. Verbal or written progress reports. 3. Finished fabricated products.		
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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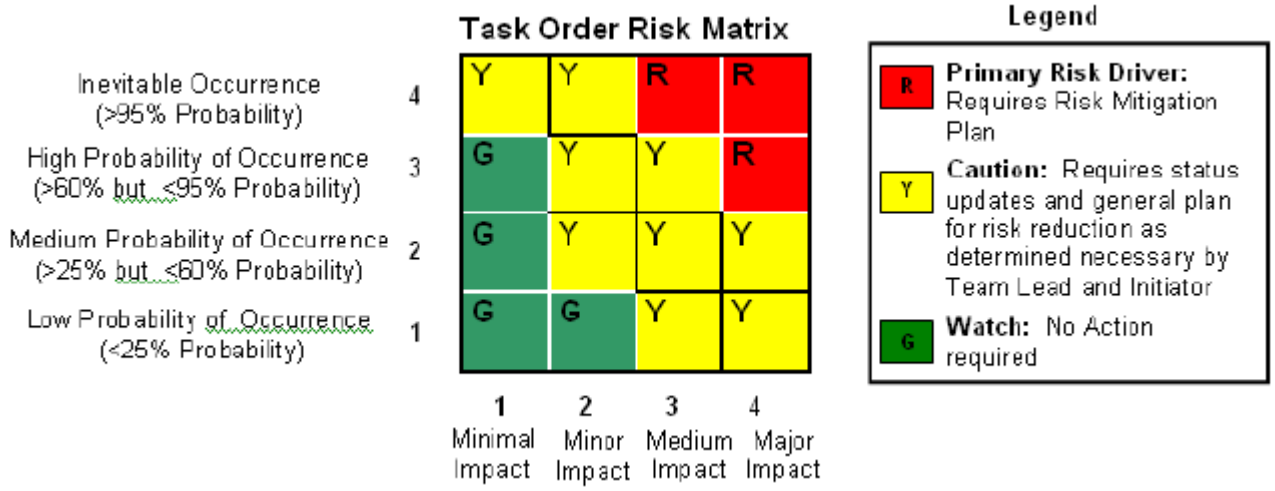
(b)(4)

Task Order Risk Assessment to Cost, Technical, and Schedule

Sub-Element: RA (X-ray and Cryogenic Facility Support)

Risk	Risk Type	Probability (1-4)	Impact (1-4)	Risk Description
Risk C1	Cost	1	1	Meet cost estimate to within 10%.
Risk C2	Cost			
Risk T1	Technical	1	1	Meet all technical objectives and goals.
Risk T2	Technical			
Risk S1	Schedule	1	1	Meet all schedule deadlines to within one week.
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