Evolved Expendable Launch Vehicle (EELV) Phase 1A
Competitive Acquisition
for L-85, L-87, SILENTBARKER, SBIRS GEO-5, and
AFSPC-44

FA8811-18-R-0001
Attachment 5
Instructions to Offerors

06 November 2017
1 PROGRAM STRUCTURE AND OBJECTIVES

1.2 The Air Force Space and Missile Systems Center (SMC) anticipates making multiple awards of launch services through this solicitation. Specifically, SMC anticipates making an individual award for each launch service mission: NROL-85, NROL-87, SILENTBARKER, SBIRS GEO-5, and AFSPC-44. The general requirements for the launch services are defined in the Performance Work Statement (PWS) and Contract Data Requirements List (CDRL), while mission-specific requirements are defined in the mission-specific Interface Requirements Document (IRD) for National Reconnaissance Office (NRO) missions and Mission Requirements Annex (MRA) for Air Force missions. Requirements in the PWS and CDRLs with specific SILENTBARKER and NRO-only references appear in grey text. Within the grey text, double-underlined references apply to both NRO and Space-Based Infrared System (SBIRS) missions.

2 GENERAL INSTRUCTIONS

2.1 The Offeror's proposal shall include all data and information requested by this Request for Proposal (RFP) and shall be submitted in accordance with (IAW) these instructions. In developing the proposal, the Offeror shall ensure that its proposed offer complies with all the requirements contained in the RFP, to include the PWSs, IRDs, MRAs, and CDRLs. Noncompliance with the instructions provided in this RFP may result in a determination that the proposal is nonresponsive and unawardable.

2.2 The Offeror’s proposal shall be clear and concise and shall include sufficient detail for effective evaluation and for substantiating the validity of stated claims. The proposal should not simply rephrase or restate the Government's requirements, but shall provide convincing rationale to address how the Offeror intends to meet these requirements. Offerors shall assume that the Government has no prior knowledge of its capabilities and experience and will base its evaluation on the information presented in the Offeror's proposal.

2.3 If the Government enters into discussions, it reserves the right to make a written request for proposal updates to incorporate any directly relevant information from ongoing early integration studies, mishap and anomaly findings, and updates to the joint work plan schedules or launch vehicle certification(s). Elaborate brochures or documentation, detailed art work, or other embellishments are unnecessary and are not desired. The proposal validity date must be specified and the proposal must be valid for at least 240 days after date of submission. IAW Federal Acquisition Regulation (FAR) Subpart 4.8 (Government Contract Files), the Government will retain one copy of all unsuccessful proposals. Unless the Offeror requests otherwise, the Government will destroy extra copies of such unsuccessful proposals.

2.4 This RFP includes five missions consisting of NROL-85, NROL-87, SILENTBARKER, SBIRS GEO-5, and AFSPC-44. This RFP is organized such that the Model Contract is applicable to each mission. Annex 1 contains mission specific criteria for NROL-85, Annex 2
contains mission specific criteria for NROL-87, Annex 3 contains mission specific criteria for SILENTBARKER, Annex 4 contains mission specific criteria for SBIRS GEO-5, and Annex 5 contains mission specific criteria for AFSPC-44. Each mission annex is discussed within the Instructions to Offerors (Attachment 5) and Evaluation Criteria (Attachment 6).

2.5 All Offerors shall respond via a proposal for all missions in this Request for Proposal (RFP). In the event an Offeror cannot technically perform a specific mission, then the Offeror shall submit a waiver for Government approval in lieu of a proposal for that specific mission.

2.6 The Government intends to make multiple award decisions: individual award decisions for (1) NROL-85, (2) NROL-87, (3) SILENTBARKER, (4) SBIRS GEO-5, and (5) AFSPC-44. The Government reserves the right to make all award decisions at once or rolling award decisions. Should an Offeror be awarded multiple missions, the missions shall be awarded and executed on one contract. Five separate award decisions shall be made to the Offeror(s) that is evaluated, based on the evaluation factors and subfactors, as the best value to the Government. The Source Selection Authority (SSA) seeks to award to the Offeror(s) who gives the Government the greatest confidence that it will meet, or exceed, the requirements. The Total Proposed Price (TPP) will be the price put on contract.

3 GENERAL INFORMATION

3.1 POINT OF CONTACT

3.1.1 The Procuring Contracting Officer (PCO), Captain Ashley Cunningham, is the sole point of contact for this acquisition. Address any questions or concerns you may have to the PCO at ashley.cunningham.4@us.af.mil or 310-653-3537. Written questions or concerns regarding this RFP may be sent to the PCO at the address for Launch Enterprise contracting office (SMC/LEK) located on the front page of the model contract/solicitation.

3.2 DEBRIEFINGS

3.2.1 The PCO will promptly notify Offerors of any decision to exclude them from the competitive range, whereupon they may request and receive a debriefing IAW FAR 15.505. In addition, the PCO will notify unsuccessful Offerors of the source selection decision IAW FAR 15.506. Upon such notification, unsuccessful Offerors may request and receive a debriefing. Offerors desiring a debriefing must make their request IAW the requirements of FAR 15.505 or 15.506, as applicable.

3.3 DISCREPANCIES

3.3.1 If an Offeror believes that the requirements in this RFP contain an error or omission, or are otherwise unsound, the Offeror shall immediately notify the PCO in writing with supporting rationale as well as the remedies the Offeror is asking the PCO to consider as related to the omission or error.
3.4 **ELECTRONIC REFERENCE DOCUMENTS**

3.4.1 Referenced documents for this solicitation are available at http://www.fedbizopps.gov. Potential Offerors are encouraged to subscribe for real-time e-mail notifications when information has been posted to the website for this solicitation.

3.5 **EXCHANGES**

3.5.1 Exchanges of source selection information between the Government and Offerors will be controlled by the PCO. Source selection information will be transmitted in person or via certified mail, delivery service, or facsimile.

3.6 **DISCUSSIONS**

3.6.1 The Government reserves the right to award any or all missions without discussions. However, the Government may conduct discussions with Offerors after establishing a competitive range based on the ratings of each proposal against all evaluation criteria. Discussions may be held on a mission-by-mission basis. The Government reserves the right to record audio telecommunications with the Offerors during the source selection.

3.7 **USE OF NON-GOVERNMENT ADVISORS**

3.7.1 Offerors are advised that data submitted to the Government in response to this solicitation will be released to individuals who work for the following companies as non-Government advisors for review and analysis:

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Aerospace Corporation</td>
<td>PO BOX 92957, Los Angeles, CA 90009-2957</td>
</tr>
<tr>
<td>Tecolote Research, Inc</td>
<td>2120 E. Grand Avenue, Suite 200, El Segundo, CA 90245</td>
</tr>
<tr>
<td>Booz Allen Hamilton</td>
<td>8283 Greensboro Drive, Mclean, VA 22102</td>
</tr>
<tr>
<td>Science Applications International Corporation (SAIC)</td>
<td>3030 Old Ranch Pkwy #200, Seal Beach, CA 90740</td>
</tr>
<tr>
<td>Linquest</td>
<td>5140 West Goldleaf Circle, Ste 400 Los Angeles, CA 90056</td>
</tr>
<tr>
<td>Stellar Solutions</td>
<td>250 Cambridge Ave Ste 204, Palo Alto, CA 94306</td>
</tr>
</tbody>
</table>
3.7.2 Offerors are advised that data submitted to the Government in response to this solicitation may be released to individuals who work for the following companies as non-Government advisors for administrative support.

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business and Technology Solutions</td>
<td>3572 Dayton-Xenia Rd, Ste 210, Beavercreek, OH 45432</td>
</tr>
<tr>
<td>ARRAY Information Technology</td>
<td>7474 Greenway Center Dr, Ste 600, Greenbelt, MD 20770</td>
</tr>
</tbody>
</table>

3.7.3 Individuals from the above support contractors have signed individual non-disclosure agreements with the Government, which strictly prohibits any release or disclosure of information outside of the source selection team.

3.7.4 Proposal submission constitutes written consent for the Government to release data submitted in response to this solicitation to the above-named companies.

3.8 ALTERNATIVE PROPOSALS

3.8.1 Alternative proposals will not be considered. Alternative proposals are those that do not meet the terms and conditions of the RFP, including attachments.

4 PROPOSAL FORMAT/LIMITS

4.1 ORGANIZATION/NUMBER OF COPIES/PAGE LIMITS

4.1.1 The Offeror shall prepare the proposal as set forth in Table 4-1: Proposal Organization. The titles and contents of the volumes shall be as defined in this table, all of which shall be within the required page limits. The Volumes identified in the table shall be separately bound in three ring, loose-leaf binders, plus each Volume’s electronic copy shall be saved on a separate compact disc (CD) or digital video disc (DVD). Volumes I, II, and VI may be combined into one (1) binder. All other Volumes shall be separate binders. For Volume IV and V, page separation tabs for each sub-factor shall be provided. The Offeror shall provide two hard copies of the proposal and two electronic copies of the proposal on CDs or DVDs. All classified sections of the proposal response will be provided in accordance with Paragraph 4.4. The contents of each proposal volume are described in the paragraph as noted in the table below:

<table>
<thead>
<tr>
<th>Volume</th>
<th>Title</th>
<th>Hard Copies</th>
<th>Electronic Copies</th>
<th>Page Limit</th>
</tr>
</thead>
</table>

Table 4-1: Proposal Organization
I  Executive Summary  2  2  10
II  Factor 1: Small Business  2  2  Unlimited
III  Factor 2: Past Performance  2  2  5 pages/contract
IVa  NROL-85  Factor 3: Performance  2  2  200
IVb  NROL-87  Factor 3: Performance  2  2  200
IVc  SILENTBARKER  Factor 3: Performance  2  2  200
IVd  SBIRS GEO-5  Factor 3: Performance  2  2  200
IVe  AFSPC-44  Factor 3: Performance  2  2  200
Va  NROL-85  Factor 5: Price  2  2  Unlimited
Vb  NROL-87  Factor 5: Price  2  2  Unlimited
Vc  SILENTBARKER  Factor 5: Price  2  2  Unlimited
Vd  SBIRS GEO-5  Factor 5: Price  2  2  Unlimited
Ve  AFSPC-44  Factor 5: Price  2  2  Unlimited
VI  Model Contract  2  2  Unlimited

4.2  PAGE LIMITATIONS

4.2.1  Page limitations shall be treated as maximums. If exceeded, the excess pages will not be read or considered in the evaluation of the proposal, and excess paper copies will be shredded. If the Government issues Evaluation Notices (EN) for discussions, page limitations may be placed on responses to EN. The specified page limits for EN responses will be identified in the letters sent along with the EN to the Offerors. Unless otherwise specified, each page shall be counted except the following: cover pages, table of contents, tabs, and glossaries. Additionally, for the Schedule Factor the Offeror may include an unlimited narrative to articulate the proposed schedule.

4.3  PAGE SIZE AND FORMAT

4.3.1  A page is defined as each face of a sheet of paper containing information. When both sides of a sheet display printed material, it shall be counted as two pages. Page size shall be 8.5 by 11 inches (in.), not including foldouts. Except for the reproduced sections of the solicitation document, the text size shall be no less than 12 point using Times New Roman font type.
Tracking, kerning, and leading values shall not be changed from the default values of the word processing or page layout software. Use at least 1 in. margins on the top and bottom and ¾ in. side margins. Pages shall be numbered sequentially by volume. These page size and format restrictions shall also apply to responses to EN.

4.3.2 Legible tables, charts, graphs, and figures shall be used wherever practical to depict organizations, systems and layout, implementation schedules, plans, etc. These displays shall be uncomplicated and legible, and shall not exceed 11 by 17 in. in size. Foldout pages shall fold entirely within the volume, and each face of the foldout containing information will be counted as a single page. Foldout pages may only be used for large tables, charts, graphs, and figures, not for pages of text. For tables, charts, graphs, and figures, the text may be in the Offeror’s preferred format.

4.4 CLASSIFIED INFORMATION

4.4.1 Where classified information is required in your response, it shall be provided as a classified supplement and bound in a single classified addendum. Each entry in the classified addendum shall be referenced to the proposal volume, page number, and paragraph number to which it applies. Similarly, a reference shall be placed in the unclassified volume where the classified insert applies, giving the page and paragraph numbers within the addendum where it can be found. If submitting hard copies of classified information, binding shall conform to the same directions as those given in this RFP for unclassified portions. The classified addendum shall be separately bound with an applicable security designation color cover, conforming to the National Industrial Security Program Operating Manual (NISPOM), DoD 5220.22M, dated 28 Feb 2006, NRO Classification Guide pg 8, NRO IPG, the DD Form 254 Contract Security Classification Specification, and the EELV Security Classification Guide. Pages in a classified addendum will be included in the page count for the applicable volume. The classified addendum shall be submitted according to the applicable security regulations as follows: DoD 5220.22M; the EELV Security Classification Guide; and the EELV DD Form 254.

4.4.2 For applicable missions, all classified information will be provided electronically via appropriate communication channels. No bound hard copies will be required. The classified addendum shall be submitted according to the applicable security regulations as follows: DoD 5220.22M, the EELV Security Classification Guide, NRO Classification Guide pg 8, NRO IPG and the EELV DD Form 254. Contact the EELV PCO no later than seven (7) calendar days prior to the proposal due date for classified data submission.

4.4.3 The Offeror shall provide proposal responses to the Government unclassified to the greatest extent possible. If classified information is required, the Offeror shall deliver it in accordance with the Security Classification Guide (SCG). All classified material shall be delivered in an Addendum to prevent entire responses to factors from unnecessarily requiring classification. Although classified information will be submitted separately as an addendum, classified sections of a volume will be counted as part of that volume and evaluated as such.
4.5 CROSS-REFERENCING

4.5.1 Each volume shall be written on a standalone basis so that its contents may be evaluated without cross-referencing to other volumes of the proposal. However, cross-referencing within a proposal volume is permitted where its use would conserve space without impairing clarity.

4.6 INDEXING

4.6.1 Each volume shall contain a table of contents with more detail than the master table of contents included in the Executive Summary Volume, to delineate the subparagraphs within that volume. Tab indexing shall be used to identify sections.

4.7 GLOSSARY OF ABBREVIATIONS AND ACRONYMS

4.7.1 Each volume shall contain a glossary of all abbreviations and acronyms used with a definition for each.

4.8 BINDING AND LABELING

4.8.1 Each volume of the proposal shall be separately bound in a three-ring, loose-leaf binder, permitting the volume to lie flat when open. Volumes I, II, and VI may be combined into one (1) binder. All other Volumes shall be separate binders. Staples shall not be used. A cover sheet shall be bound in each volume, clearly marked as to volume number, title, copy number, solicitation identification, and the Offeror’s name. The same identifying data shall be placed on the spine of each binder. All unclassified document binders shall have a color other than red or other applicable security designation colors. Be sure to apply all appropriate markings including those prescribed IAW FAR 52.215-1(e) (Restriction on disclosure and use of data) and FAR 3.104-4 (Disclosure, Protection, and Marking of Contractor Bid or Proposal Information and Source Selection Information).

4.9 ELECTRONIC OFFERS

4.9.1 The content and page size of electronic copies must be identical to the hard copies. All CDs shall be placed in plastic sleeves that open on the top in one separate binder, with the volume number and title indicated on each disc. Hypertext links shall be used to facilitate navigation within the document. Use separate files to permit rapid location of all portions, including factors, exhibits, annexes, and attachments, if any. If files are compressed, the necessary decompression program must be included. The electronic copies of the proposal shall be submitted in a format readable by Microsoft (MS) Office Word 2007/2010, MS Office Excel 2007/2010, MS Office Project 2007/2010, and MS Office Power Point 2007/2010, as applicable; exception applies to the Executive Summary and the Model Contract. In the event there are discrepancies between the hard copies and the electronic copies of the proposal, the electronic copies will be used for evaluation. The “original” hardcopy and electronic copy of the proposal shall be identified.
4.10 DELIVERY INSTRUCTIONS

4.10.1 Delivery of proposals shall be coordinated with the PCO at least 24 hours in advance of the due date and time. If a proposal contains classified information, Offerors shall coordinate with the PCO at least seven (7) calendar days in advance of the due date and time. Early deliveries of proposals shall also be coordinated with the PCO. Electronic and hard copies of proposals are due XX Month 2018 by 4:00 pm Pacific Standard Time. Proposals received after the date and time specified will be treated IAW FAR 52.212-1(f).

Proposals shall be addressed to the PCO and mailed or hand carried to:

SMC/LEK
Attn Primary: Capt Ashley Cunningham
Attn Alternate: Ms. Dzung Dom
483 N. Aviation Blvd.
El Segundo, CA 90245

5 VOLUME I – EXECUTIVE SUMMARY

5.1 The purpose of the Executive Summary Volume is to provide a complete overview of the Offeror’s proposal. The Executive Summary Volume will not be evaluated, scored, or used to clarify other discrepant information in other volumes. Any summary material presented in the Executive Summary Volume will not be considered as meeting the requirements for any portions of other volumes of the proposal. Do not include cost information. The Offeror shall provide the following information in the Executive Summary:

5.2 NARRATIVE SUMMARY

5.2.1 The narrative summary of the entire proposal shall be concise, to include addressing any risk areas and mitigations, and highlighting any key or unique features. The salient features shall tie in with the evaluation factors in Attachment 6, Evaluation Criteria.

5.3 OFFEROR’S PROPOSED TEAM

5.3.1 The Offeror shall briefly identify the Offeror’s team to include major subcontractors.

5.4 MASTER TABLE OF CONTENTS

5.4.1 The Offeror shall include a master table of contents of the entire proposal.

5.5 CROSS REFERENCE MATRIX

5.5.1 The Offeror shall fill in the proposal column of the cross reference matrix below with the volume, sections, and paragraph numbers from their proposal that correspond with the paragraph numbers from Attachment 5 and Attachment 6 listed below.
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume I: Executive Summary</td>
<td>5.1</td>
<td>N/A</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5.2</td>
<td>N/A</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5.3</td>
<td>N/A</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>Volume II: Small Business</td>
<td>6</td>
<td>2.3</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>Volume III: Past Performance</td>
<td>7.1</td>
<td>7.5</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>7.1.5</td>
<td>7.5.1</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Volume IVa: NROL-85</td>
<td>10.1</td>
<td>10.1</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Volume Va: NROL-85 Price</td>
<td>10.2</td>
<td>10.2</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Volume IVb: NROL-87</td>
<td>11.1</td>
<td>11.1</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Volume Vb: NROL-87 Price</td>
<td>11.2</td>
<td>11.2</td>
<td>Y</td>
<td></td>
</tr>
<tr>
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<td></td>
</tr>
<tr>
<td>Volume Vc: SILENTBARKER Price</td>
<td>12.2</td>
<td>12.2</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Volume IVd: SBIRS GEO-5</td>
<td>13.1</td>
<td>13.1</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Volume Vd: SBIRS GEO-5 Price</td>
<td>13.2</td>
<td>13.2</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Volume IVe: AFSPC-44</td>
<td>14.1</td>
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</tr>
<tr>
<td>Volume Ve: AFSPC-44 Price</td>
<td>14.2</td>
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<td></td>
</tr>
<tr>
<td>Volume V: Price FRONT MATTER</td>
<td>8.1</td>
<td>8.1</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Volume VI: Model Contract</td>
<td>N/A</td>
<td>N/A</td>
<td>N</td>
<td></td>
</tr>
</tbody>
</table>
6 VOLUME II – SMALL BUSINESS

6.1 FACTOR 1: SMALL BUSINESS PARTICIPATION

6.1.1 The Offeror shall complete Attachment 3B, Small Business Participation Commitment Document (SBPCD). The Offeror shall provide a SBPCD that will include information on how the Offeror will meet the small business participation Minimum Quantitative Requirement of 4% based upon total contract value (TCV) such that TCV includes the base and all exercised options.

6.1.2 Other than Small Business (OTSB) Offerors shall provide the Small Business Subcontracting Plan as required by FAR 19.7 and 52.219-9. OTSB Offerors shall provide evidence of at least one (1) arrangement with, or the extent of the commitment to use, small businesses (e.g., contractual documentation or letter of intent) with the small business concerns identified within the subcontracting plan submitted IAW FAR clause 19.7 and 52.219-9.

6.1.3 The Offeror shall provide the Small Business Subcontracting Plan as required by FAR 19.7, FAR 52.219-9, and AFFARS 5319-704(a)(1). The SBPCD is a separate document than the Small Business Subcontracting Plan. The Subcontracting Plan will be assessed IAW FAR 19.704. Both documents will be evaluated per the evaluation criteria, Attachment 6, Paragraph 6. The SBPCD and the Small Business Subcontracting Plan will be incorporated into the contract as attachments.

7 VOLUME III – INSTRUCTIONS FOR PAST PERFORMANCE & SCHEDULE

7.1 FACTOR 2: PAST PERFORMANCE

7.1.1 Past Performance Information (PPI) Forms

7.1.1.1 Each Offeror shall submit a past performance volume with its proposal, containing past performance information IAW the format contained in Appendix B.

7.1.1.2 The Government will use data provided by each Offeror in this volume as well as data obtained from other sources in its evaluation of past performance.

7.1.2 Volume Organization

7.1.2.1 The Past Performance volume should be organized according to the following general outline:
   a. Table of Contents
   b. Relevant Contracts (Attachment 5 Appendix B)
   c. Attachments (Attachment 5 Appendix C Attachment 5 Appendix D, and Attachment 5 Appendix E)
   d. Glossary of Abbreviations and Acronyms

7.1.3 Consent/Authorization Letters
7.1.1.3 Along with the PPI required in this paragraph, the Offeror shall submit a consent letter, Appendix C, executed by each subcontractor, authorizing release of adverse past performance information to the Offeror so the Offeror can respond to such information. For each identified effort for a customer, the Offeror shall also submit a client authorization letter, Appendix D, authorizing release to the Government of requested information on the Offeror's performance.

7.1.4 Recent and Relevant Contracts

7.1.4.1 Offeror’s shall submit information IAW Appendix B: Past Performance Information Instructions, on four recent and relevant contracts that demonstrate its ability to perform the proposed effort; reference Attachment 6, Paragraphs 7.4 (Recency Evaluation) and 7.5 (Relevancy Evaluation), for recency and relevancy definitions. Offeror’s shall submit at least one effort relevant to each of the missions. If no recent or relevant past performance information exists, notify the PCO in writing by the date specified in Paragraph 4.10 (Delivery Instructions).

7.1.4.2 Specific Content

7.1.4.2.2 Offerors are required to explain what aspects of the contracts are deemed relevant to the proposed effort and to what aspects of the proposed effort they relate. The Offeror is responsible for ensuring that all information provided in the Past Performance Volume is current, accurate, complete and properly classified. This may include a discussion of efforts accomplished by the offeror to resolve problems encountered on prior contracts as well as past efforts to identify and manage program risk. If the Offeror has encountered problems on previous efforts, then the Offeror is required to clearly demonstrate management actions employed in overcoming those problems and the effects of those actions in terms of improvements achieved or problems rectified.

7.1.4.2.3 Offerors shall provide the narrative within Appendix B to support how the past performance information submitted for evaluation demonstrates the offeror's ability to meet the scope of this contract.

7.1.5 Past Performance Questionnaires (PPQs)

7.1.5.1 The Offeror shall forward the PPQ template, Appendix E, to each contract POC identified in the PPIs.

7.1.5.2 The Offeror should monitor the completion of the questionnaires and make every effort to ensure completed questionnaires are submitted by the submission deadline.

7.1.5.3 Questionnaire respondents shall email completed PPQs directly to the following POC listed below by the proposal submittal date. Submission of contact information for previous relevant contracts IAW Attachment 5 is due via email no later than XX XXX 2018. The information to be submitted shall include customer name with two points of contact (name and title, email, phone number, and address). Information contained in a completed PPQ shall be considered source selection information and shall not be released to the Offeror.

Los Angeles Air Force Base
Attn Primary: Capt Ashley Cunningham
E-Mail to: ashley.cunningham.4@us.af.mil
Attn Alternate: Ms. Dzung Dom
E-Mail to: dzung.dom@us.af.mil
483 N. Aviation Blvd
El Segundo, CA 90245

7.1.5.4 Even though the assessment of Past Performance is separate and distinct from Determination of Responsibility required by FAR 9, past performance information evaluated during source selection may be used to support the Determination of Responsibility for the successful awardee.

7.1.6 Small Business Subcontracting History

7.1.6.1 Pursuant to Defense Federal Acquisition Regulation System (DFARS) 215.305, all Offerors (large and small) shall provide a narrative describing its use of small business concerns over the past three (3) years on the recent, relevant efforts submitted for Government consideration under this factor. Proposals shall describe the actual use of small businesses as subcontractors, joint venture/teaming partners and demonstrate the extent of compliance with FAR 52.219-8, Utilization of Small Business Concerns, the Offeror's small business subcontracting plans (other than small businesses only), and any related contract incentives. Other than small business Offerors shall specifically describe the small business goals for all categories of small business and the extent to which the goals were achieved in contracts that required subcontracting plans for the past three years. To supplement the narrative summary, other than small business Offerors shall provide the most recent Individual Subcontracting Reports or Summary Subcontract Reports for each relevant contract that required submission of such reports. These subcontracting reports will not count against the page limitations for the Past Performance volume.

7.2 FACTOR 4: SCHEDULE

This volume addresses the Offeror’s technical approach and solution for meeting the Government’s requirements for each Schedule sub-factor. The Offeror shall describe their proposed approach to meeting the requirements of each sub-factor. Offeror responses will be evaluated against the Schedule criteria defined in Attachment 6, Evaluation Criteria, Paragraph 9.4. Risk Mitigation Plans for Factor 4: Schedule will be assessed in sub-factor 2, Risk Mitigation Plans.

7.2.1 SUB-FACTOR 1: INTEGRATED MASTER SCHEDULE (IMS)

7.2.1.1 The Government expects the proposal response to Factor 4, Schedule to be unclassified. Offeror shall provide multiple Microsoft Project IMS, multiple hard copy of the full IMS, and SRA for each mission (NROL-85, NROL-87, SILENTBARKER, SBIRS GEO-5 and AFSPC-44) launch services proposed. The source selection team reserves the right to use program office
risk assessments, anomaly analysis, and other schedule risks as appropriate. The Offeror shall construct all of the RFP 1A-6 mission’s IMS as follows:

7.2.1.1 Each IMS shall include elements a-g listed below at a minimum. Additionally, the IMS shall include all non-recurring design validation (NRDV) activities applicable to the as-proposed launch vehicle configuration and launch pad that relate to the following: Management Systems, Flight Experience, System Design Validation, Design Reliability, Manufacturing & Operations and Systems Engineering Process Validation, System Safety, Test and Verification, Quality Systems/Processes, Flight Hardware and Software Qualification, Launch Vehicle Analysis, Risk Management, Integrated Analysis, Launch Complex, and Air Force EELV Requirements.

a. Discrete tasks consistent with all proposed work;
b. Task durations based on an approximation of required resources;
c. Relationships/dependencies that identify how predecessor and successor tasks and milestones are logically linked;
d. Milestones;
e. Total float/slack;
f. Task and milestone descriptions that clearly identify the scope and deliverable of the work being accomplished, including LOE tasks;
g. Identified Critical Paths

7.2.1.2 Each IMS shall be an integrated, logically driven network constructed at the lowest level of tasks that form the network to identify a valid critical path.

7.2.1.3 Each IMS shall identify three Critical Paths: primary (zero float), secondary (0.5-5 days of schedule float), and tertiary (5.5-14 days of schedule float). Each Critical Path shall have a different critical driver based upon the sequence of activities which represent the longest path between the activities’ start and finish dates for the respective levels of schedule float.

7.2.1.4 Each IMS shall have tasks with traceability to the WBS, providing a text field that maps the task to each WBS sections in IAW Appendix A. For every WBS section in the IMS, the level of detail shall be at least one level lower than the lowest WBS element to create an integrated network of tasks to support the full scope of work of the proposed NROL-85, NROL-87, SILENTBARKER, SBIRS GEO-5 and AFSPC-44 launch services WBS.

7.2.1.5 The Offeror shall identify all schedule margin within each IMS.

7.2.1.6 The IMS task durations shall be supported by the resource-loading of workforce (labor) resources. The task durations shall be based on the Offeror’s estimation of the personnel and skillsets required to accomplish the scope of each task. The resource sheet (within Microsoft Project) shall identify the specific workforce resources at the lowest level required to demonstrate credibility of the task duration with a description of the personnel and skillsets required for each task IAW CDRL A006, block 4 and block 16. The Offeror shall not assign resources to milestone events (defined as key programmatic events which represent progress and completion of the contract).
7.2.1.1.7 The Offeror shall support IMS task durations excluding LOE tasks (defined as activities which are typically related to management and other oversight that continues until the detailed activities they support have been completed), Schedule Visibility Tasks (SVTs are defined as tasks/activities or milestones in the IMS which increase management visibility and functionality of the schedule for items not related to the Performance Measurement Baseline) and milestones with at least one or more of the following: actual historical performance data, rationale and/or lessons learned. The use of LOE tasks, SVTs, and milestones shall be IAW DI-MGMT-81861A/T. To support the credibility of task durations, the Offeror may provide statement(s) of assumptions. The Offeror shall provide a summary of historical performance data, rationale and lessons learned used to determine all task durations. The Offeror shall provide actual data and basis of estimation (historical performance data, rationale, lessons learned, and statements of assumptions) for all Critical Paths within the schedule narrative.

7.2.1.2 Each IMS shall reflect the following activities sufficient to support the NROL-85, NROL-87, SILENTBARKER, SBIRS GEO-5 and AFSPC-44 launch services as follows:

7.2.1.2.1 The IMS for each mission shall reflect either a start date no earlier than the following according to each mission ILC:

a. NROL-85: 4QFY21 ILC (30 months integration required)
b. NROL-87: 3QFY21 ILC (30 months integration required)
c. SILENTBARKER: 1QFY22 (30 months integration required)
d. SBIRS GEO-5: 2QFY21 (30 months integration required)
e. AFSPC-44: 1QFY21 (24 months integration required)

7.2.1.2.2 Each IMS shall encompass all tasks required to accomplish the NROL-85, NROL-87, SILENTBARKER, SBIRS GEO-5 and AFSPC-44 launch services proposed from contract award to contract completion, to include activities to accomplish the tasks in the PWS, Program Milestone Reviews (PWS, Appendix H), and CDRLs, IAW the WBS.

7.2.1.2.3 Each IMS shall identify all critical events to include but not limited to the following: LV production with identification of the longest lead hardware; testing at the component, subsystem, system, and integrated level; major reviews; encapsulation; transport; integrated testing; LV/PL mate; and ILC.

7.2.1.2.4 If applicable, each IMS shall include tasks sufficient to accomplish the non-recurring design validation work and Risk Mitigation Plans as described in paragraph 7.2.2.2 and 7.2.2.3 in support of the NROL-85, NROL-87, SILENTBARKER, SBIRS GEO-5 and AFSPC-44 launch services, to include appropriate durations. To support task durations, the Offeror shall provide at least one of the following within the schedule narrative: actual historical performance data, rationale, or lessons learned. All Non-recurring design validation work and Risk Mitigation Plan tasks shall be resource loaded.

7.2.1.2.5 The Offeror’s proposal shall include the ILC of the Offeror’s forecasted launches during the timeframe of contract start to the NROL-85, NROL-87, SILENTBARKER, SBIRS GEO-5 and AFSPC-44 ILCs as part of the schedule narrative. The Offeror’s proposal shall also provide a summary of critical milestone events (booster, upper stage, and fairing ship dates) for
the Offeror’s other launches during the timeframe of contract start to ILC for the NROL-85, NROL-87, SILENTBARKER, SBIRS GEO-5 and AFSPC-44 launch services proposed as part of the schedule narrative.

7.2.1.3 Schedule Risk Assessment – The Offeror shall perform a SRA of the NROL-85, NROL-87, SILENTBARKER, SBIRS GEO-5 and AFSPC-44 launch services IMS to predict the probability of project completion to support the NROL-85, NROL-87, SILENTBARKER, SBIRS GEO-5 and AFSPC-44 ILCs IAW the sub-criteria below. Additionally, the Government reserves the right to run the Monte Carlo simulation-based SRA input data to evaluate SRA results utilizing a tool called the Full Monte.

7.2.1.3.1 The Offeror shall perform a 10,000-iteration Monte Carlo simulation-based SRA, and provide the results of the SRA in the Schedule Narrative.

7.2.1.3.2 The SRA results shall provide a probability (histogram) distribution curve using Triangular Distribution as defined in the Air Force Acquisition Excellence & Change Office (AQXC) (Schedule Risk Assessment (SRA) Process reference document) for ILC, including specific completion dates for every 10th percentile from 10 to 90 percent.

7.2.1.3.3 The Offeror shall develop individual three-point estimates (best case, most likely, and worst case) for all tasks on the Critical Paths, non-recurring design validation work IAW paragraph 7.2.2.2, and tasks which are low-medium, medium, or high risk captured in the Offeror’s Risk Mitigation Plan IAW paragraph 7.2.2.3 below. The Offeror shall provide fields within the Microsoft Project File listing the three-point estimates. If the Offeror cannot provide three-point estimates, the Offeror shall use the standard global editing percentages for minimum and maximum durations as follows: Low Risk (85-110%), Medium Risk (90-115%), and High Risk (95-125%) (refer to Air Force Acquisition Excellence & Change Office (AQXC) Schedule Risk Assessment (SRA) Process, Global Editing / Risk Banding). The Offeror shall provide a summary within the schedule narrative to explain the rationale and assumptions where a three-point estimate is not provided.

7.2.1.3.4 Three-point estimates shall be supported by the Offeror’s actual historical performance data if the task has been previously performed. If the task has not been previously performed, the Offeror shall provide rationale to justify three-point estimates. The Offeror shall provide a summary within the schedule narrative to explain the use of historical performance data, rationale, lessons learned, and assumptions used to determine all three-point estimates. If the Offeror provides standard global editing percentages for minimum and maximum durations, those will be considered in the evaluation.

7.2.1.4 DCMA 14 Point Schedule Assessment – The Offeror shall construct the IMS IAW the DCMA 14 Point Schedule Assessment guidelines, excluding Invalid Dates, Resources, Missed Tasks, and Baseline Execution Index. The Offeror shall provide justification for each component of the IMS that falls beyond the guideline thresholds. This analysis shall exclude Completed Tasks, LOE tasks, Summary Tasks (tasks made up of subtasks which show their combined information), Milestones, and Space Vehicle Contractor (SVC) tasks.
7.2.1.4.1 Logic – The number of activities that are missing a predecessor, a successor, or both shall not exceed the threshold of 5% of the activities within the Offeror’s IMS. Provide justification for the use of predecessor/successor relationships beyond the 5% threshold of all activities within the Offeror’s IMS.

7.2.1.4.2 Leads – The number of activities with leads (negative lag) shall not exceed the threshold of 0% of the activities within the IMS. Provide a justification for each lead relationship used in the IMS.

7.2.1.4.3 Lags – The total number of activities with lags shall not exceed the threshold of 5% of the activities within the Offeror’s IMS. Provide justification for the use of lag relationships beyond the 5% threshold for all activities within the Offeror’s IMS.

7.2.1.4.4 Relationship Types – The total number of activities with Finish-To-Start (FS) logic links shall be at least 90 percent. Tasks with all other logic links Start-To-Start (SS) and Finish-To-Finish (FF) should be less than the threshold of 10% of total tasks within the IMS. Provide justification for the use of logic links other than (FS) relationships beyond the 10% threshold for all activities within the Offeror’s IMS.

7.2.1.4.5 Hard Constraints – The number of activities with hard constraints (Must-Finish-On, Must-Start-On, Start-No-Later-Than, & Finish-No-Later-Than) shall not exceed the threshold of 5% of the activities within the Offeror’s IMS. Provide a justification for the use of hard constraints beyond the 5% threshold for all activities within the Offeror’s IMS. If soft constraints are needed other than As-Soon-As-Possible (Start-No-Earlier-Than and Finish-No-Earlier-Than), the Offeror shall provide a field within the Microsoft Project File that contains a summary justification of these constraints used in the IMS.

7.2.1.4.6 High float – The number of activities with a total float (the amount of time a task/activity or milestone forecast finish date can slip before delaying contract completion or constraint date) greater than two (2) months (44 working days) shall not exceed the threshold of 5% of the activities within the Offeror’s IMS. Provide justification for the use of activities with a total float greater than 2 months beyond the 5% threshold of the activities within the Offeror’s IMS.

7.2.1.4.7 Negative Float – The number of activities with a total float of less than zero (0) days shall not exceed the threshold of 0% of the activities within the Offeror’s IMS. Provide justification for the use of activities with a total float of less than 0 days within the Offeror’s IMS.

7.2.1.4.8 Long Duration – The number of activities with a duration greater than two (2) months (44 working days) shall not exceed the threshold of 5% of the activities within the Offeror’s IMS. Provide justification for the use of activities with a duration greater than 2 months that exceeds the 5% threshold of the activities within the Offeror’s IMS.

7.2.1.4.9 Critical Path Test – When an activity’s duration on the critical path is intentionally slipped by “X” amount of days (assuming zero float), where “X” is equal to a gross increase in duration (e.g., 600 days), the critical path within the Offeror’s IMS shall demonstrate
a corresponding extension of “X” amount of days to the project completion date and to the ILC. Provide justification if either the project completion date or the ILC are not delayed in direct proportion to the amount of intentional slip that is introduced into the critical path.

7.2.1.4.10 Critical Path Length Index – The CPLI is equal to the CPL (critical path length) in days + the TF in days divided by the CPL in days. The ratio of the critical path length plus the total float to the critical path length within the Offeror’s IMS shall be ≥ 0.95, with > 0.95 being favorable, and < 0.95 being unfavorable. Provide justification if the CPLI of the Offeror’s IMS is < 0.95.

7.2.2 SUB-FACTOR 2: RISK MITIGATION PLANS

7.2.2.1 The Offeror shall identify the launch vehicle system, baseline configuration, and block/build sequence proposed. The Offeror shall also provide an initial Flight Critical Items List (FCIL) associated with the launch vehicle system proposed IAW CDRL B018, block 4 and block 16. The FCIL will be incorporated into the contract as Attachment 10 upon award.

7.2.2.2 As stated in Section 7.2.1.1, the Offeror shall provide a schedule with task durations to complete all remaining open NRDV work applicable to the as-proposed launch vehicle configuration and launch pad and obtain Government approval by a threshold of L-12 months. Reference the PWS, Appendix A: Glossary of Terms, for the NRDV definition. For the purposes of this proposal, the Contractor shall assume that Government approval of the open NRDV work will be obtained 2 months following completion of final contractor NRDV efforts. The Offeror shall also identify NRDV tasks on the critical path for this mission. Should the Government enter into discussions with the Offeror(s), the Government reserves the right to request an updated detailed description of the Offeror’s progress toward completing all remaining open NRDV work (to potentially include requesting an updated IMS).

7.2.2.3 Risk Mitigation Plans

The risk mitigation plan shall support low risk rating as defined by the TIRP which impacts ILC.

a. The Offeror shall provide a risk mitigation plan for the proposed launch vehicle configuration to address any risks (Government-identified or Offeror-identified Low-Medium, Medium, and High risks IAW Technical Issue Resolution Process (TIRP), Air Force Pamphlet (AFPAM) identified by the Joint Work Plan, EELV Engineering Review Boards, EELV Flight Readiness Reviews, and other technical reviews to the Offeror’s proposed launch vehicle configuration.

b. The Offeror shall identify any Low-Medium risks previously accepted by the Government via EELV Spaceflight Worthiness Certification in lieu of a risk mitigation plan. For identified risks that are in the process of having its risk rating reassessed by the Government, the Offeror shall assume the risk applies to the proposed launch system and include the risk mitigation plan if the original risk rating is “Low-Medium” or higher. The risk mitigation plan shall support low risk rating as defined by the TIRP prior to ILC.

c. The risk mitigation plan shall support low risk rating as defined by the TIRP prior to ILC. Should the Government enter into discussions with the Offeror(s), the Government reserves the
right to request an updated detailed description of the Offeror’s progress towards the closure of identified risks. Additionally, should the Government enter into discussions, updated risk mitigation plans and IMS may be required during discussions.

7.2.2.4 The Offeror shall provide the following: (1) status of ongoing mishap or anomaly investigations, (2) any root cause data, and (3) determination and associated corrective actions to support ILC. Should a mishap or flight anomaly be opened or under investigation after the receipt of proposals, the Government reserves the right to require a risk mitigation or corrective action plan specifically for that mishap or flight anomaly prior to award.

7.2.2.5 Should the Offeror propose to use excess launch vehicle performance above the mission requirements to accomplish secondary objectives (as defined in PWS Appendix A Glossary of Terms), the Offeror shall provide a detailed plan for the use of excess margin and demonstrate “do-no-harm” IAW the PWS, paragraphs 3.4 and 3.5.1.15.6. An Offeror’s “do-no-harm” assessment needs to include the Offeror’s plan for commercial licensing, indemnification, liability, and concept of operations on a non-interference basis to the Government’s mission.

Should NRDV be required, the Offeror shall provide a risk mitigation plan for the proposed use of the launch vehicle excess performance to close all remaining open NRDV work by Launch minus (L-) 12 months. Offeror responses will be evaluated against the Schedule criteria defined in Attachment 6, Evaluation Criteria, Paragraph 9.4.2.5.

8 VOLUME V – PRICE FRONT MATTER

8.1 FACTOR 5: PRICE

8.1.1 The Offeror shall fill in prices for Tables 10-6 NROL-85, 11-6 NROL-87, 12-6 SILENTBARKER, 13-6 SBIRS GEO-5, 14-6 AFSPC-44 as instructed in paragraphs 8.2 through 8.4 below. The Offeror shall not include price information in any other portion of the proposal, except the Price Volume or Model Contract. When completing 10-6, 11-6, 12-6, 13-6, 14-6, the Offeror shall fill in the same prices as those proposed in the model contract for all applicable Contract Line Item Numbers (CLINs) which are included in the Total Proposed Price; this also includes the Quick Reaction/Anomaly Resolution rate.

8.2 QUICK REACTION/ANOMALY RESOLUTION

8.2.1 For Quick Reaction and Anomaly Resolution, the Offeror shall complete Table 8-1 as shown below and provide the resulting number (Total Proposed Dollars) for Tables 10-6, 11-6, and 12-6, 13-6, 14-6. For the model contract, the Offeror shall provide one composite rate for each year of the contract period of performance (Composite Rate = Total Proposed Dollars/Total Hours) which will apply to all missions awarded. The maximum number of hours in Tables 10-6, 11-6, and 12-6, 13-6, 14-6 will reflect the sum of the hours associated with the mission awarded.
### Table 8-1: Quick Reaction and Anomaly Resolution Calculation

<table>
<thead>
<tr>
<th>Mission and Mission Hours</th>
<th>Years</th>
<th>(A) Hours</th>
<th>(B) Proposed Rate</th>
<th>(C) Proposed Annual Dollars (A*B)</th>
<th>(D) Other Comments</th>
<th>Total Proposed Dollars</th>
<th>Fill in Table 10-6</th>
</tr>
</thead>
<tbody>
<tr>
<td>NROL-85 25,000 Hours</td>
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<tr>
<td></td>
<td>Yr 2</td>
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<td>Yr 3</td>
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<td><strong>Fill in Table 10-6</strong></td>
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<tr>
<td>NROL-87 25,000 Hours</td>
<td>Yr 1</td>
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<td><strong>Fill in Table 11-6</strong></td>
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<td><strong>Total Proposed Dollars</strong></td>
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<td><strong>Fill in Table 12-6</strong></td>
<td></td>
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<tr>
<td>SBIRS GEO-5 25,000 Hours</td>
<td>Yr 1</td>
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<td><strong>Fill in Table 13-6</strong></td>
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<tr>
<td>AFSPC-44 25,000 Hours</td>
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<td><strong>Total Proposed Dollars</strong></td>
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<td></td>
<td></td>
<td><strong>Fill in Table 14-6</strong></td>
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</tr>
</tbody>
</table>

#### Calculation for SMC/LE H-0005

<table>
<thead>
<tr>
<th>Column (C) Total</th>
<th>Column (C) Total /125,000 hours</th>
</tr>
</thead>
</table>

### 8.3 Mission Unique Requirements and Options

8.3.1 The Offeror shall provide a proposed price for each mission unique requirement and option listed in Tables 10-6 NROL-85, 11-6 NROL-87, 12-6 SILENT BARKER, 13-6 SBIRS GEO-5, and 14-6 AFSPC-44; reference Tables 3.1-1, 3.1-2, 3.2-1, 3.3-1, 3.3-2, and 3.3-3 in the Mission Requirements Annex (MRA) Frontmatter for a list of mission unique requirements and options. Note that unit pricing and maximum quantity order prices shall be provided in the
Model Contract. The Offeror shall provide these proposed prices as an itemized list which corresponds to the mission unique requirements and options in the referenced tables. TEP shall be priced at the maximum quantity proposed in the Model Contract CLINs.

8.4 GOVERNMENT PROPERTY (GP)

8.4.1 If the Offeror requires the use of GP, the Offeror shall complete Table 8-2 in Microsoft Excel format using the acquisition cost information from Attachment 8 and the rental equivalency method described in FAR 52.245-9(e)(2) as laid out below:

- In Column (A), identify the requested GP
- In Column (B), identify the acquisition cost from Attachment 8 and list the dollar value
- In Column (C), multiply column (B) by 2% (round to the nearest dollar) to determine the monthly acquisition cost of the item and list the dollar value
- In Column (D), divide column (C) by 720 to determine the hourly rental rate (round to the nearest cents) and list the dollar value
- In Column (E), propose the rental time required (round to the nearest whole hour) and list the value; “rental time” is defined in 52.245-9(a)
- In Column (F), multiply column (D) by (E) (round to the nearest dollar) to determine the total rental charge for the requested item and list the dollar value
- Add the sum of Rental Charges per mission in Column (F) and include in Tables 10-6, 11-6, and 12-6, 13-6, 14-6.

Table 8-2: Rental Equivalency for Government Property Use

<table>
<thead>
<tr>
<th>Item Requested</th>
<th>Acq Cost ($)</th>
<th>Monthly Acq Cost ($ Multiply B *2%)</th>
<th>Hourly Rental Rate (Divide C by 720) ($)</th>
<th>Rental Time (per mission)</th>
<th>Rental Charge (Multiply D*E) ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item A</td>
<td>$100,000</td>
<td>$2,000</td>
<td>$2.78</td>
<td>400</td>
<td>$1,112</td>
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<tr>
<td>Item B</td>
<td>$77,777</td>
<td>$1,556</td>
<td>$2.16</td>
<td>250</td>
<td>$540</td>
</tr>
</tbody>
</table>

*Notional cost figures are included in the table as examples only*

9 VOLUME VI – MODEL CONTRACT

9.1 GENERAL INSTRUCTIONS
9.1.1 The purpose of this volume is to provide information to the Government for preparing the contract document and supporting file. The Offeror’s proposal shall include one (1) signed and dated copy of the Standard Form (SF) 1449, delivered with the SF 1449 Continuation pages, the Addendum, the Contract Documents, and Exhibits and Attachments. The original shall be clearly marked and shall be provided without any punched holes. The SF 1449 shall not have any proprietary markings. Fill in all blanks in the Solicitation. Specifically, complete the following:

9.2 SF1449 SOLICITATION/CONTRACT FORM

9.2.1 The Offeror shall complete blocks 12, 17, and 30 on SF 1449 – Solicitation/Contract/Order for Commercial Items. The Offeror shall use the SF 1449 Continuation in place of completing blocks 19, 20, 21, 22, and 23. The signature by the Offeror on the SF 1449 constitutes an offer, which the Government may accept.

9.3 SF1449 CONTINUATION SUPPLIES OR SERVICES AND COSTS/PRICES:

9.3.1 The Offeror shall provide prices on all CLINs. For mission unique options, provide both unit prices and total maximum quantity prices. The Offeror shall provide the proposed launch vehicle configuration within the X000 description of launch vehicle production services.

9.4 DEFENSE PRIORITIES AND ALLOCATIONS SYSTEM RATING OF CONTRACT

9.4.1 Under Defense Priorities and Allocations System (DPAS) (15 CFR 700), all missions are rated DX.

9.5 CONTRACT DOCUMENTS, EXHIBITS AND ATTACHMENTS

9.5.1 Attachment 3A: Small Business Subcontracting Plan

9.5.1.1 The Offeror shall provide a Small Business Subcontracting Plan IAW FAR 52.219-9 and Air Force Federal Acquisition Regulation Supplement 5319.704. The subcontracting plan will be incorporated into the contract and assessed IAW FAR 19.704.

9.5.2 Attachment 3B: Small Business Participation Commitment Document (SBPCD)

9.5.2.1 The Offeror shall provide SBPCD IAW Paragraph 6.1 (Factor 1: Small Business Participation). The SBPCD will be incorporated into the contract.

9.5.3 Attachment 7: Mission Requirement Annex (MRA)

9.5.3.1 If the Offeror proposes the use of excess performance margin, the Offeror shall complete and submit Attachment 7, MRA Front matter, Table 3-0: Proposed Excess Performance Margin. 9.5.3.2 Attachment 7, MRA, along with the proposed plan to use excess performance margin as Appendix A, will be incorporated into the awarded contract.

9.5.4 Attachment 8: Government Property
9.5.4.1 If the Offeror requires the use of GP, the Offeror shall complete and submit Attachment 8, Government Property, IAW procedures and definitions detailed in DFARS 245.103-72 and 245.201-70. For more information, see the Department of Defense Procurement Toolbox at http://www.dodprocurementtoolbox.org/site/detail/id/26. Failure to complete each applicable data field in Attachment 8 may render the Offeror non-responsive and unawardable. For each item of GP requested, the “Use As Is” column shall be filled in as “true.”

9.5.4.2 For each item of GP requested, the Offeror shall provide a written authorization of availability from the cognizant Administrative Contracting Officer (ACO). GP proposed without an authorization from the cognizant ACO may render the Offeror non-responsive and unawardable. All supporting documentation associated with GP shall be submitted outside of the model contract within Volume V.

9.5.5 Attachment 9: Payment Plan

9.5.5.1 The Offeror shall fill in the dollar amount associated with each payment milestone in Table 1 of Attachment 9, Payment Plan. There are two payment plans, one for missions with multi-maneuvers and one for missions without multi-maneuvers. The applicable payment plan will be filled out for each mission. These plans will become an attachment to the contract if the mission is awarded. IAW FAR 32.204 alternative financing terms shall not be accepted.

9.5.6 Attachment 10: Potential Organizational Conflict of Interest (OCI)

9.5.6.1 IAW FAR 9.5, Organizational and Consultant Conflicts of Interest, the Contracting Officer has analyzed the planned acquisition and determined that a potential OCI situation exists with respect to this solicitation.

9.5.6.2 The Offeror shall perform its own OCI analysis and submit the results of that analysis as part of its proposal and provide an OCI plan to be incorporated as Attachment 11 to any resulting contract. Specifically, the Offeror shall analyze the planned acquisition for actual or potential OCI situations associated with its or any of its teammate’s or subcontractor’s performance under any contract it or any of its teammates or subcontractors has been or may be awarded by any federal agency or other entity. The Offeror shall describe in detail the methodology used to identify actual or potential OCI issues. At a minimum, the OCI plan shall address all of the items identified in the most current version of SMC’s OCI Plan Checklist provided in the Bidder’s Library. Any proposed avoidance or mitigation techniques shall be consistent with FAR 9.5 and the most recent decisions of the Government Accountability Office and the United States Court of Federal Claims.

9.5.6.3 If award is made to the Offeror, the resulting contract may include an organizational conflict of interest limitation applicable to subsequent Government work, at either a prime contract level, at any subcontract tier, or both. During evaluation of proposals, the Government may, after interactions with the Offeror and consideration of ways to mitigate or avoid identified actual or potential conflicts of interest, insert a clause or term and condition in the resulting contract which disqualifies the Offeror from further consideration for award of future contracts.
9.5.6.4 Resolution of OCI issues are treated in a manner similar to the Contracting Officer’s contractor responsibility determination. Any communications necessary to resolve OCI issues shall not be considered discussions. As such, the Contracting Officer may issue Evaluation Notices to the Offeror prior to any decision to enter into discussions in order to resolve questions or concerns with the Offeror’s OCI analysis or mitigation plan.

9.5.7 Attachment 11: Flight Critical Items List (FCIL)
9.5.7.1 The Offeror shall identify the launch vehicle system, baseline configuration, and block/build sequence proposed. The Offeror shall also provide an initial Flight Critical Items List (FCIL) associated with the launch vehicle system proposed IAW CDRL B018, block 4 and block 16. The FCIL will be incorporated into the contract as Attachment 11 upon award.

9.5.8 Attachment 12: Security Plan
9.5.8.1 The Offeror shall provide a detailed security plan to manage and process classified payloads (Special Access Program/Special Access Required for the classified missions), and handle and protect classified mission data (requirements, analysis inputs and results) IAW the Security Classification Guide (SCG) as referenced in the classified mission IRDs. The proposed plan shall be supported by previously demonstrated efforts and a description of how previously demonstrated efforts will be applied or modified for this mission. If never demonstrated, the Offeror shall provide evidence-based rationale to support the proposed plan. The security plan shall be attached to the contract as Section J, Attachment 12, failure to demonstrate that the plan is may render the proposal non-responsive and unawardable.

9.6 SOLICITATION PROVISIONS
9.6.1 All representations and certifications must be completed IAW FAR 52.212-3 deviation in the model contract, Offeror Representations and Certifications - Commercial Items.

9.7 SIGNATURE
9.7.1 The Offeror’s signature on the SF 1449 constitutes an offer, which the Government may or may not accept. Proposals without signatures may warrant a rejection of the proposal submittal. Offerors are required to meet all solicitation requirements, including terms and conditions, representations and certifications, and technical requirements. Therefore, any tailoring to the solicitation is not allowed and may warrant a rejection of the proposal.

10 ANNEX 1: NROL-85
10.1 VOLUME IVa L-85 FACTOR 3: PERFORMANCE
10.1.1 This volume addresses the Offeror’s technical approach and solution for meeting the Government’s requirements for each Performance sub-factor. The Offeror shall describe their proposed approach to meeting the requirements of each sub-factor. Offeror responses will be
evaluated against the Performance criteria defined in Attachment 6, Evaluation Criteria, Paragraph 10.

10.1.2 Reserved

10.1.3 The Offeror shall provide proposal responses to the Government unclassified to the greatest extent possible. If classified information is required, the Offeror shall deliver it in accordance with the Security Classification Guide (SCG). All classified material shall be delivered in an Addendum to prevent entire responses to factors from unnecessarily requiring classification.

10.1.4 SUB-FACTOR 1: ORBITAL ACCURACY

10.1.4.1 The Offeror shall complete the Proposed NROL-85 3-Sigma Injection Accuracy column in Table 10-1 for the proposed launch vehicle system of the NROL-85 mission and use the stated target as the requirement. 3-sigma for Injection Accuracy is defined as 99.73% probability at 50% confidence.

**Table 10-1: NROL-85 Orbit Injection Target and Accuracy Requirements** (see notes)

<table>
<thead>
<tr>
<th>Parameter (1)</th>
<th>Orbit Injection Target Requirement</th>
<th>Minimum Accuracy Requirement</th>
<th>Maximum Accuracy Requirement</th>
<th>Proposed NROL-85 3-sigma Injection Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semi-major Axis (km)</td>
<td>7500.5 km</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Apogee Radius (km)</td>
<td>N/A</td>
<td>- 22 km</td>
<td>+ 22 km</td>
<td></td>
</tr>
<tr>
<td>Perigee Radius (km)</td>
<td>N/A</td>
<td>- 9.2 km</td>
<td>+ 9.2 km</td>
<td></td>
</tr>
<tr>
<td>Eccentricity</td>
<td>0.0131</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Inclination (deg)</td>
<td>63.535 deg</td>
<td>-0.15 deg</td>
<td>+0.15 deg</td>
<td></td>
</tr>
<tr>
<td>Argument of Perigee (deg)</td>
<td>190.0 deg</td>
<td>-5.0 deg</td>
<td>+5.0 deg</td>
<td></td>
</tr>
<tr>
<td>Right Ascension of Ascending Node (deg)</td>
<td>0 - 360 deg</td>
<td>-0.2 deg</td>
<td>+0.2 deg</td>
<td></td>
</tr>
</tbody>
</table>

Note 1: Orbit parameters are defined at separation command issuance as mean orbit parameters in true-of-date (TOD) coordinate frame using WGS84 EGM 96 for the earth’s gravitational model.

Note 2: RAAN = RAAN0 + Ωt, where RAAN = Required RAAN (deg) at SV separation (determines optimum launch time), RAAN0 = RAAN (deg) referenced to 0 GMT on first day of 30-day launch period (referenced to true-of-date (TOD) coordinate frame), Ωt = Rate of change (deg/sec) of RAAN (i.e., nodal
regression rate), \( t = \text{time (sec)} \) at SV separation referenced from 0 GMT on first day of 30-day launch period

10.1.4.2 The Offeror shall provide a detailed description of their approach to meet all orbital injection parameters and accuracy requirements described in Table 10-1. Additionally the Offeror shall provide detailed description of impacts to orbital injection accuracy across the entire target box in Table 3.4.1.1-1 of the IRD to protect all possible orbit opportunities. The description shall provide clear linkages between the approach to meet requirements and the demonstrated performance of the proposed or current family of launch vehicle system. The description shall also include the following:

a. Identification of the launch vehicle system models utilized in the Monte Carlo analysis. Provide a detailed description of the proposed launch vehicle configuration and specific block or version including, but not limited to, payload fairing configuration and engine version. Provide any model changes required to meet the proposed launch vehicle configuration and impacts of these changes to the Monte Carlo results.

b. A detailed description of the Monte Carlo used to establish the injection accuracies from Table 10-1.

c. A minimum of 10,125 runs must be performed.

d. Complete Table 10-2 with a list of all dispersions used in the methodology for establishing the injection accuracies from Table 10-1, including justifications in a separate narrative paragraph.

e. Provide risk mitigation approach for any new or undemonstrated launch vehicle capabilities that impact the Monte Carlo analysis.

10.1.4.3 Dispersions are defined as variations on performance and navigation input parameters (e.g., thrust, Isp, sensor bias/scale factors, etc.) used to generate injection accuracy and separation parameter results. Dispersions shall be listed in Table 10-2 with required data to describe the dispersions used, including statistical distribution type (e.g., Gaussian, uniform).

<table>
<thead>
<tr>
<th>Dispersion</th>
<th>-3 sigma value</th>
<th>Nominal</th>
<th>+3 sigma value</th>
<th>Statistical Distribution Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parameter (subscript i)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parameter 2 (subscript i=n)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

10.1.4.4 The Offeror shall provide a completed Table 10-3, Historical Orbital Injection Accuracy, for each of the four most recent (as of final RFP posted date) low earth orbit launches of a launch vehicle system similar to the proposed launch vehicle system. If the launch history
does not include four low earth orbit launches, then the Offeror shall complete Table 10-3 with data from as many low earth orbit launches as flown and supplement with data for the most recent launches (as of final RFP posted date). Historical launches should not include those that had a burn-to-depletion mission design for spacecraft injection. The Offeror shall provide detailed supporting rationale behind any changes to the dispersions (Table 10-3) or methodology used in generating the predicted accuracies for either the historical low earth orbit launches or the most recent launches (as of final RFP posted date).

**Table 10-3: Historical Orbital Injection Accuracy**

<table>
<thead>
<tr>
<th>Reference Missions</th>
<th>Apogee Altitude (km)</th>
<th>Perigee Altitude (km)</th>
<th>Inclination (deg)</th>
<th>Argument of Perigee (deg)</th>
<th>RAAN (deg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-Sigma Requirement (Min, Target, Max)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-Sigma Prediction (Min, Mean, Max)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Actual</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: deg = degrees, km = kilometers

10.1.4.5 The Offeror shall provide technical evaluation of impacts to Orbital Accuracy criteria due to secondary objectives not required by the NROL-85 and Rideshare IRDs for evaluation by the Government, as proposed under Attachment 5, paragraph 7.2.2.5. If the proposed secondary objectives do not impact this sub-factor, the Offeror shall provide historical evidence or detailed supporting rationale.

**10.1.5 SUB-FACTOR 2: LOADS AND DYNAMICS**

10.1.5.1 The Offeror shall provide a detailed description of their approach to meet the launch vehicle/space vehicle acoustics requirement in the NROL-85 IRD paragraph 3.3.4.2.1, and describe mitigation plans, if any, for meeting the IRD requirements. The Offeror’s approach shall address:

a. How the payload fairing acoustic environment for the NROL-85 mission is determined/predicted
b. A description of the analysis methodology used to predict or estimate acoustics in the fairing
c. The method and basis for the proposed approach to maintain the acoustics within the required levels

10.1.5.2 The Offeror shall provide verification that LVC will not violate loads specified in the NROL-85 IRD paragraph 3.3.4.1 and provide historical data showing compliance with loads during horizontal/vertical payload handling operations.
10.1.5.3 The Offeror shall provide a detailed description of their approach to meet the payload oscillation requirement in NROL-85 IRD paragraph 3.1.2.4, and describe mitigation plans, if any, for meeting the IRD requirement.

10.1.5.4 The Offeror shall provide technical evaluation of impacts to Loads and Dynamics criteria due to secondary objectives, not required by the NROL-85 and Rideshare IRDs, for evaluation by the Government, as proposed under Attachment 5, paragraph 7.2.2.5. If the proposed secondary objectives do not impact this sub-factor, the Offeror shall provide historical evidence or detailed supporting rationale.

10.1.6 SUB-FACTOR 3: LAUNCH OPERATIONS

10.1.6.1 The Offeror shall provide a Launch Operations CONOPS which includes a description of the proposed launch operations flow from the time the Government provides the NROL-85 SV to the Offeror as Government property for encapsulation through liftoff, to include any contingency procedures.

10.1.6.2 The Offeror shall provide technical rationale for CONOP acceptability, appropriate approval documentation from the launch base range, and graphic representation of the proposed CONOPS for Sub-factor 3. The Offeror shall include the details of the Launch Operations CONOPS schedules in the response for Factor 4, Schedule. The Offeror shall show compliance with the requirements in Appendices C and D of the NROL-85 IRD.

a. The Offeror shall provide the NROL-85 SV sufficient time in the schedule to perform a three (3) day umbilical checkout within seven (7) days of the encapsulated assembly being mated to the launch vehicle. The Offeror shall provide simulation cables to complete the circuit to the SEIP from the EGSE room and provide an environmentally protected test area with 120 VAC power at the end of the simulation cables. The Offeror can schedule this checkout when the LV is in the horizontal or vertical position.

b. The Offeror shall provide the NROL-85 SV sufficient time in the schedule prior to launch to perform five (5) days of launch preparations after the Encapsulated Assembly and the EAGE are attached to the launch pad umbilical. The Offeror can schedule this checkout when the LV is in the horizontal or vertical position.

10.1.6.3 The Offeror shall provide a Launch Concept of Operations (CONOPS) which includes the integrated SV/LV processing and encapsulation plans which are oriented to the Payload Processing Facility (PPF) building 2520 at Vandenberg Air Force Base for a Western Range solution or the Eastern Processing Facility (EPF) at Cape Canaveral Air Force Station for an Eastern Range solution.

10.1.6.4 The Offeror shall provide CONOPS for the transportation and integration of the Encapsulated Assembly (EA) onto the Launch Vehicle (LV) to meet the requirements in the NROL-85 IRD paragraphs 3.5.3, 3.5.4, and 3.5.5.2.
10.1.6.5 The Offeror shall provide verification that the required Payload clocking in NROL-85 IRD Figure 3.5.4-1 is technically feasible to support the planned CONOPS at the launch base.

10.1.6.6 The Offeror shall provide a detailed description of their approach for LV to SV mechanical and electrical interface verification for demonstrated compliance with the requirements in the NROL-85 IRD paragraphs 3.1.1.4.2, 3.2.3.7.5.5, 3.2.3.7.5.6, and 3.2.3.7.5.7.

10.1.6.7 The Offeror shall provide technical evaluation of impacts to Launch Operations criteria due to secondary objectives not required by the NROL-85 and Rideshare IRDs for evaluation by the Government, as proposed under Attachment 5, paragraph 7.2.2.5. If the proposed secondary objectives do not impact this sub-factor, the Offeror shall provide historical evidence or detailed supporting rationale.

10.1.7 SUB-FACTOR 4: MISSION UNIQUE INTEGRATION

10.1.7.1 The Offeror shall provide CONOPS for the integration of the Secondary SVs, which would be available at NET L-4 months in the launch processing flow, in accordance with the Rideshare IRD. The following should be considered for purposes of proposal evaluations when developing the CONOPs and technical interface documentation for the integration of the secondary SVs:

a. The Government will provide final Secondary SV design properties, mission design constraints, and configuration to the LVC NLT Launch (L) – 12 months.

b. The Secondary SVs will be delivered to the Offeror ready for installation onto the LV.

c. No unique security requirements are needed in the processing of the Secondary SVs.

d. During ground processing the LVC shall provide access to Secondary SVs for battery charging and closeout operations per the Rideshare IRD paragraphs 3.1.1.7 and 3.2.4.

e. The Government will provide Mass Simulators if either of the Secondary SVs are not available to support launch.

10.1.7.2 The Offeror shall provide CONOPs and technical documentation to support installation of the Secondary SVs on the aft end of the upper stage, not within the Encapsulated Assembly (EA), with appropriate mechanical and electrical interfaces for the dispensers, in accordance with the Rideshare IRD. The Offeror shall provide mechanical and electrical drawings of interfaces and historical data on usage. Historical data shall include the following:

a. Numbers of missions utilizing the Rideshare configuration, if no previous examples exist then provide the first planned mission with this Rideshare configuration.

b. History of design certification reviews for the Rideshare capability.

c. Any known risks or concerns for implementation of the Rideshare configuration on the NROL-85 mission.

10.1.7.3 The Offeror shall demonstrate capability to provide environmental control of the Secondary SVs prior to installation with a GN2 purge in addition to maintaining environments
through launch processing consistent with the Rideshare Users Guide (RUG) and the Rideshare IRD for the NROL-85 mission.

10.1.7.4 The Offeror shall demonstrate capability to support door open and redundant door open commands for each dispenser. The Offeror shall also demonstrate ability to supply telemetry for the door open/close and occupancy status of each dispenser.

10.1.7.5 The Offeror shall provide a detailed description of their approach for placing the two 12U CubeSats in the same initial orbit as the Primary SV. The Offeror shall demonstrate capability to meet all requirements provided in the Rideshare IRD for the NROL-85 mission and all integration constraints defined in the Rideshare Users Guide (RUG). The Offeror shall provide a detailed description of their approach to perform deployment of the two 12U CubeSats per IRD section 3.4 to include sub-paragraphs.

10.1.7.6 The Offeror shall provide an analysis to show that re-contact between the Primary SV, two 12U CubeSats, and upper stage will not occur within 5 orbit revolutions. The Offeror shall assume that each CubeSat and Dispenser have a combined weight of 40 kg and a CubeSat weight of 30 kg. The Offeror shall assume a relative separation velocity of 1 fps for each separation event of the CubeSats.

10.1.7.7 The Offeror shall provide a detailed description of their approach to complete electrical trailblazer between L-18 and L-12 months. The electrical trailblazer will require 7 days of pad access to complete. The Offeror’s approach shall address the following for demonstrated compliance with the requirements in the NROL-85 IRD paragraphs in Appendix A and B:

10.1.7.7.1 Electrical trailblazers for the EGSE includes physically verifying launch complex EGSE room requirements (per IRD 3.5.8, 3.5.10 and sub requirements), umbilical characteristics (per IRD 3.2.4.1.2 and sub requirements) and fiber/network connectivity checkouts at the launch complex. The intent of the umbilical characteristics trailblazer is to physically measure, to the greatest extent possible, the umbilical characteristics from the SVIP in the EGSE room to the SEIP. Short segments of the electrical path may be simulated with flight-like cables. The Offeror shall provide an environmentally protected test area and 120VAC power at the SV end of the umbilical for SVC provided EGSE to complete the circuits.

10.1.7.8 The Offeror shall provide mitigation plans for any areas of non-compliance with NROL-85 IRD requirements.

10.1.7.9 The Offeror shall provide technical evaluation of impacts to Mission Unique Integration criteria due to secondary objectives not required by the NROL-85 and Rideshare IRDs for evaluation by the Government, as proposed under Attachment 5, paragraph 7.2.2.5. If the proposed secondary objectives do not impact this sub-factor, the Offeror shall provide historical evidence or detailed supporting rationale.

10.1.8 SUB-FACTOR 5: MASS-TO-ORBIT
10.1.8.1 The Offeror shall provide a detailed description of the mass-to-orbit capability associated with the proposed launch vehicle system for the NROL-85 mission based on launching from the proposed Range (Eastern or Western) for the Target and Accuracy Requirements in Table 10-1. The Offeror shall provide an analysis and a description of the methodology used to generate the final mass-to-orbit for the NROL-85 mission. At a minimum, the launch vehicle shall have the capability of injecting the Total Mass, described on Table 10-4, to the Target Requirements defined on Table 10-1. This analysis and methodology shall be based on either demonstrated flight performance or engineering data. The Offeror shall provide an evaluation of risks, opportunities, and impacts to meeting the entire target orbit box in Table 3.4.1.1-1 of the IRD.

10.1.8.2 The Offeror shall fill in the vehicle specific payload equivalent mass values in Table 10-4. The Offeror shall provide the upper stage performance margin to the NROL-85 mission profiles included in the proposal with the Total Mass as defined in Table 10-4. The “Max SV Mass Used” and the “Payload Adapter Mass” in Table 10-4 shall be greater than or equal to the SV total mass and PLA total mass respectively as indicated in the NROL-85 IRD with the appropriate assumptions for the launch range chosen by the Offeror. The Offeror shall also provide the performance reserves as specified below.

a. 3-sigma Flight Performance Reserve value (defined as 99.865% probability at 50% confidence) calculated by Monte Carlo methodology with a minimum of 10,125 runs performed to the NROL-85 profiles included in the proposal with the Total Mass as defined in Table 10-4
b. NRO/OSL Reserve (defined as the sum of 2% of the proposed launch system performance capability to the reference orbit in Table 10-1 with Orbital Debris Mitigation Standard Practice (ODMSP) compliance plus 75 pounds mass (lbm) of upper stage dry mass for instrumentation reserve, converted to upper stage propellant equivalent mass)
c. Description and quantification of any additional reserves held
d. Any additional performance margin

### Table 10-4: Mass-to-Orbit

<table>
<thead>
<tr>
<th>Description</th>
<th>Mass</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max SV Mass Used</td>
<td></td>
<td>lbs.</td>
</tr>
<tr>
<td>Payload Adapter Mass (See Note 1)</td>
<td></td>
<td>lbs.</td>
</tr>
<tr>
<td>Rideshare (See Note 2)</td>
<td></td>
<td>lbs.</td>
</tr>
<tr>
<td>Total Mass</td>
<td></td>
<td>lbs.</td>
</tr>
</tbody>
</table>

Note 1: Payload Adapter (PLA) Mass is the mass of the PLA hardware including all associated harnesses, the separation system and attached hardware required for flight.

Note 2: Section 10.1.7.6 of the Instruction for Offerors provides Rideshare Mass Assumptions
10.1.8.3 The Offeror shall provide the planned NROL-85 Mission Profile including upper stage disposal approach. The mission profile shall include the proposed launch site and significant sequence of events to include times with respect to liftoff. At a minimum, the sequence of events shall include the following mission profile events listed below (a-k). If event is not applicable, the Offeror shall provide supporting rationale.

   a. First stage engine start
   b. Solid rocket motor burnout and jettison sequence (if applicable)
   c. First stage engine cutoff and separation
   d. Payload fairing jettison
   e. Upper stage engine burn ignition(s), cutoff(s) and coast time(s)
   f. SV separation
   g. Auxiliary SV separation
   h. Initiation of upper stage CCAMs
   i. Upper stage disposal initiation
   j. End of mission for upper stage, where end of mission is defined as the completion of passivation with no further planned maneuvers, or through upper stage impact after controlled reentry
   k. Additionally at the SV separation event (not including the effects of separation ∆V), the orbital parameters (as defined in Table 10-1) shall be provided for those flight profiles included in the proposal.

10.1.8.4 The Offeror shall provide methodology and results demonstrating ≥ 90% probability of success, utilizing the Monte Carlo analysis with a minimum of 10,125 runs performed, for completing the planned upper stage disposal (ODMSP compliance is not waiverable).

10.1.8.5 The Offeror shall provide data for any portion of the NROL-85 mission profile that has been flight demonstrated (T-0 to disposal burn) by the proposed or current family of launch vehicle system. Examples of data could include a table of demonstrated burn durations vs. planned burn durations; demonstrated coast durations vs. planned; re-entries achieved vs. planned; etc. The Offeror shall also identify on which flight the mission profile portion was demonstrated. The Offeror shall identify any portion of the mission profile that has not yet been flight demonstrated by proposed or current family of launch vehicle system. Undemonstrated portions of a mission profile may include, but are not specifically limited to:

   a. Total proposed mission duration from launch to End of Mission is greater than 10 minutes longer than a previously flown mission
   b. Number of proposed upper stage engine relights is greater than previously flown
   c. Coast duration between upper stage engine relights is greater than 5 minutes from a previously flown mission
   d. Booster or upper stage throttle settings outside the range of previously flown throttle settings
e. Proposed CCAM or upper stage disposal solution have not been previously flown (per EELV SPRD, Rev. A)
f. Radiation environments not previously demonstrated

10.1.8.5.1 If any of the Offeror’s previous flights do not demonstrate portions of the NROL-85 mission profile to include, but not limited to 10.1.8.5. a–f, then the Offeror shall provide a detailed engineering and risk analysis of the affected launch vehicle subsystems and components, and any risks or limiting factors associated with the design or configuration of the affected subsystems. The Offeror shall provide a mitigation approach that addresses the identified risks associated with the undemonstrated portion of the proposed mission profile.

10.1.8.6 The Offeror shall provide the ground trace and instantaneous impact point trace through end of mission or through upper stage impact if conducting a controlled reentry, with identification of nominal jettisoned body impacts. The nominal jettisoned body impacts shall occur over water. Nominal jettisoned bodies include those planned under a controlled recovery operation. If the Offeror plans to de-orbit the upper stage, they shall provide the impact ellipse. The upper stage reentry location shall be in a broad ocean area. Casualty expectation value, if applicable, and supporting analysis including mission reliability and failure scenarios shall be provided.

10.1.8.7 The Offeror shall provide historical data, from liftoff through upper stage disposal, on the final mission design trajectory predictions and flight data for mission profiles (including sequence of events and PL orbital parameters at separation) and for vehicle acceleration comparison plots for the four most recent launches (as of final RFP posted date) of a launch vehicle system similar to the proposed launch vehicle system, or as many as have been launched if fewer than four launches have taken place. Individual acceleration plots shall be provided for each burn of each stage. If the launch included a controlled reentry of the upper stage, the final mission design prediction for the impact ellipse from flight data estimated after all propulsive events shall be provided. If historical flight data does not corroborate predictions, the Offeror shall provide detailed supporting rationale to explain differences.

10.1.8.8 The Offeror shall provide technical evaluation of impacts to Mass-to-Orbit criteria due to secondary objectives not required by the NROL-85 and Rideshare IRDs for evaluation by the Government, as proposed under Attachment 5, paragraph 7.2.2.5. If the proposed secondary objectives do not impact this sub-factor, the Offeror shall provide historical evidence or detailed supporting rationale.

10.2 VOLUME Va L-85 FACTOR 5: PRICE

10.2.1 All dollar amounts provided shall be rounded to the nearest dollar. All labor rates shall be rounded to the nearest dollar.
10.2.2 The Offeror shall provide their proposed price for the launch service allocated to categories shown in Table 10-6. This allocation shall conform to the following WBS element to CLIN mapping, and PWS paragraph to CLIN mapping:

a. CLIN 1000, Launch Vehicle Production, consists of WBS elements 1.6, 1.8.1.1, 1.8.1.2, 1.8.1.3, 1.8.2.1, 1.8.2.2, 1.8.3, 1.8.4, 1.8.5, 1.8.6, 1.8.7, 1.9, and 1.10, and all subsections therein; and consists of PWS paragraph 3.3, 3.5.4 and all subsections therein.

b. CLIN 1001, Mission Integration: consists of PWS paragraph 3.4.

c. CLIN 1002 Launch Ops /Spaceflight Worthiness Certification, consists of WBS elements 1.1.1, 1.2, 1.3, 1.5.1, 1.5.2, 1.5.3, and 1.7, and all subsections therein; and consists of PWS paragraphs 3.1, 3.2, 3.5 (except 3.5.4), and 3.6, and all subsections therein.

d. CLIN 1100, Quick Reaction and Anomaly Resolution, the maximum number of 25,000 hours consists of PWS paragraph 3.7, and all subsections therein.

Table 10-6: NROL-85 Total Evaluated Price Calculation

<table>
<thead>
<tr>
<th>MISSION</th>
<th>CLIN</th>
<th>DESCRIPTION</th>
<th>CONTRACT TYPE</th>
<th>TOTAL PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>NROL-85</td>
<td>1000</td>
<td>Launch Vehicle Production Service</td>
<td>FFP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1001</td>
<td>Mission Integration</td>
<td>FFP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1002</td>
<td>Launch Ops / Spaceflight Worthiness Certification</td>
<td>FFP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1100</td>
<td>Quick Reaction and Anomaly Resolution – 25,000 max hours</td>
<td>FFP</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rental Equivalency of Government Property</td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Total Evaluated Price (TEP)</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

11 ANNEX 2: NROL-87

11.1 VOLUME IVb L-87 FACTOR 3: PERFORMANCE

11.1.1 This volume addresses the Offeror’s technical approach and solution for meeting the Government’s requirements for each Performance sub-factor. The Offeror shall describe their proposed approach to meeting the requirements of each sub-factor. Offeror responses will be evaluated against the Performance criteria defined in Attachment 6, Evaluation Criteria, Paragraph 11.

11.1.2 Reserved

11.1.3 The Offeror shall provide proposal responses to the Government unclassified to the greatest extent possible. If classified information is required, the Offeror shall deliver it in
accordance with the Security Classification Guide (SCG). All classified material shall be delivered in an Addendum to prevent entire responses to factors from unnecessarily requiring classification.

**11.1.4 SUB-FACTOR 1: LAUNCH OPERATIONS AND INTEGRATION**

11.1.4.1 The Offeror shall provide a Launch Operations CONOPS which includes a description of the proposed launch operations flow from the time the Government provides the NROL-87 SV to the Offeror as Government property for encapsulation through liftoff, to include any contingency procedures.

11.1.4.2 The Offeror shall provide technical rationale for CONOP acceptability, appropriate approval documentation from the launch base range, and graphic representation of the proposed CONOPS for Sub-factor 1. The Offeror shall include the details of the Launch Operations CONOPS schedules in the response for Factor 4, Schedule.

11.1.4.3 The Offeror shall provide a Launch Operations CONOPS which includes the integrated SV/LV processing and encapsulation plans which are oriented to the processing facility the Government has required the Offeror to use at Vandenberg Air Force Base for a Western Range solution.

11.1.4.4 The Offeror shall provide a Launch Operations CONOPS which includes a description and diagrams of propellant-compatible interface plumbing and aspirator IAW the contingency offload requirements defined in the requirement of the NROL-87 IRD paragraph 3.7.2.

11.1.4.5 The Offeror shall provide a detailed plan to manage and process classified payloads. The proposed plan shall be supported by previously demonstrated efforts and a description of how previously demonstrated efforts will be applied or modified for this mission. If never demonstrated, the Offeror shall provide evidence-based rationale to support the proposed plan.

11.1.4.6 The Offeror shall provide a detailed plan for Contamination Management from the time the Government provides the NROL-87 SV to the Offeror as Government property for encapsulation through T-0 launch. The proposed plan shall be supported by previously demonstrated efforts and a description of how previously demonstrated efforts will be applied or modified for this mission. If never demonstrated, the Offeror shall provide evidence-based rationale to support the proposed plan.

11.1.4.7 The Offeror shall provide a detailed plan for GN2 Purge from the time the Government provides the NROL-87 SV to the Offeror as Government property for encapsulation through T-0 launch. The proposed plan shall be supported by previously demonstrated efforts and a description of how previously demonstrated efforts will be applied or modified for this mission. If never demonstrated, the Offeror shall provide evidence-based rationale to support the proposed plan.
The Offeror shall provide a detailed description of their approach for an optional rideshare opportunity to include the (1) integration of two Government provided integrated 12U CubeSat/Dispensers (secondary SVs) on the launch vehicle and (2) launch and deployment of Secondary SVs into an initial (TDB) orbit.

The Offeror shall provide technical evaluation of impacts to Launch Operations and Integration criteria due to secondary objectives, not required by the NROL-87 and Rideshare IRDs, for evaluation by the Government, as proposed under Attachment 5, paragraph 7.2.2.5. If the proposed secondary objectives do not impact this sub-factor, the Offeror shall provide historical evidence or detailed supporting rationale.

11.1.5 SUB-FACTOR 2: SHOCK AND ACOUSTICS

The Offeror shall provide a detailed description of their approach to meeting the maximum expected (P95/50) internal fairing acoustic environment requirements in NROL-87 IRD paragraphs 3.3.4.3. The analysis shall include any acoustic fill effect for the candidate launch vehicle and fairing configurations and assume a maximum average SV diameter of 4.152 meters. The analysis shall also include applicable adjustments for a West Coast launch, and should describe mitigation plans, if any, for meeting the IRD requirements. The Offeror’s approach shall address:

a. How the payload fairing acoustic environment for the NROL-87 mission is determined/predicted
b. A description of the analysis methodology used to predict or estimate acoustics in the fairing
c. The method and basis for the proposed approach to maintain the acoustics within the required levels

The Offeror shall provide shock analysis using existing test or flight data with appropriate scaling and a P95/50 statistical envelope to show that the candidate launch vehicle maximum expected shock environment on the launch vehicle adapter side of the LV-SV interface will not exceed the SV capabilities specified in NROL-87 IRD Figure L2-LSRD-175, assuming the SV mass and axial c.g., in NROL-87 IRD Table L2-LSRD-259.

The Offeror shall provide technical evaluation of impacts to Shock and Acoustics criteria due to secondary objectives, not required by the NROL-87 and Rideshare IRDs, for evaluation by the Government, as proposed under Attachment 5, paragraph 7.2.2.5. If the proposed secondary objectives do not impact this sub-factor, the Offeror shall provide historical evidence or detailed supporting rationale.

11.1.6 SUB-FACTOR 3: ORBITAL ACCURACY

The Offeror shall complete the Proposed NROL-87 3-Sigma Injection Accuracy column in Table 11-1 for the proposed launch vehicle system of the NROL-87 mission and use the stated target as the requirement, for demonstrated compliance with the requirements in the NROL-87 IRD paragraphs 3.4.3 and 3.4.3.1. The nominal insertion orbit is a Sun-synchronous,
near circular orbit with a Mean Local Time of Ascending Node (MLTAN) of midnight and a semi-major axis range as shown in tables L2-LSRD-193 and L2-LSRD-194. 3-sigma for Injection Accuracy is defined as 99.73% probability at 50% confidence.

Table 11-1: NROL-87 Orbit Injection Target and Accuracy Requirements

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Orbit Injection Target</th>
<th>Minimum Accuracy Requirement</th>
<th>Maximum Accuracy Requirement</th>
<th>Proposed NROL-87 3σ Injection Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semi-major Axis (km)</td>
<td>6890.7</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Apogee Radius (km)</td>
<td>N/A</td>
<td>-10</td>
<td>+10</td>
<td></td>
</tr>
<tr>
<td>Perigee Radius (km)</td>
<td>N/A</td>
<td>-10</td>
<td>+10</td>
<td></td>
</tr>
<tr>
<td>Inclination (deg)</td>
<td>97.4</td>
<td>-0.1</td>
<td>+0.1</td>
<td></td>
</tr>
<tr>
<td>MLTAN</td>
<td>0.00 sec</td>
<td>-20 min</td>
<td>+20 min</td>
<td></td>
</tr>
<tr>
<td>Eccentricity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Argument of Perigee</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note 1: Orbit parameters are defined in the EME2000 Coordinate System post separation

11.1.6.2 The Offeror shall provide a detailed description of their approach to meet all orbital injection targets and accuracy requirements described in Table 11-1. The description shall provide clear linkages between the approach to meet requirements and the demonstrated performance of the proposed or current family of launch vehicle system. The description shall also include the following:

a. Identification of the launch vehicle system models utilized in the Monte Carlo analysis. Provide a detailed description of the proposed launch vehicle configuration and specific block or version including, but not limited to, payload fairing configuration and engine version. Provide any model changes required to meet the proposed launch vehicle configuration and impacts of these changes to the Monte Carlo results.

b. A detailed description of the Monte Carlo used to establish the injection accuracies from Table 11-1.

c. A minimum of 10,125 runs must be performed.

d. Complete Table 11-2 with a list of all dispersions used in the methodology for establishing the injection accuracies from Table 11-1, including justifications in a separate narrative paragraph.

e. Provide risk mitigation approach for any new or undemonstrated launch vehicle capabilities that impact the Monte Carlo analysis.

11.1.6.3 Dispersions are defined as variations on performance and navigation input parameters (e.g., thrust, Isp, sensor bias/scale factors, etc.) used to generate injection accuracy
and separation parameter results. Dispersions shall be listed in Table 11-2 with required data to describe the dispersions used, including statistical distribution type (e.g., Gaussian, uniform).

Table 11-2: Dispersions List

<table>
<thead>
<tr>
<th>Dispersion</th>
<th>-3 sigma value</th>
<th>Nominal</th>
<th>+3 sigma value</th>
<th>Statistical Distribution Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parameter (subscript i)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parameter 2 (subscript i=n)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

11.1.6.4 The Offeror shall provide a completed Table 11-3, Proposed NROL-87 Separation Parameter Accuracy.

Table 11-3: NROL-87 Separation Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Requirement</th>
<th>Accuracy</th>
<th>Proposed NROL-87 Separation Parameter Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Separation Tip-off Rate (per SV axes), including separation system contribution (deg/sec/axis)</td>
<td>≤ 0.5</td>
<td>3-sigma</td>
<td></td>
</tr>
<tr>
<td>SV Separation attitude (deg)</td>
<td>+Xsv axis pointed at the sun</td>
<td>≤ 5 deg half cone angle (3-sigma)</td>
<td></td>
</tr>
</tbody>
</table>

Note 1: For evaluation purposes only, assume T-0 (launch) is on 1 Apr 2021 at 1700 hours (GMT).
Note 2: SV separation is defined as the LV issuance of the respective separation command

11.1.6.5 The Offeror shall provide a completed Table 11-4, Historical Orbital Injection Accuracy, for each of the four most recent (as of final RFP posted date) sun-synchronous, near circular orbit launches of a launch vehicle system similar to the proposed launch vehicle system. If the launch history does not include four sun-synchronous, near circular orbit launches, then the Offeror shall complete Table 11-4 with data from as many sun-synchronous, near circular orbit launches as flown and supplement with data for the most recent launches (as of final RFP posted date). Historical launches should not include those that had a burn-to-depletion mission design for spacecraft injection. The Offeror shall provide detailed supporting rationale behind any changes to the dispersions or methodology used in generating the predicted accuracies for either
the historical sun-synchronous, near circular orbit launches or the most recent launches (as of final RFP posted date).

### Table 11-4: Historical Orbital Injection Accuracy

<table>
<thead>
<tr>
<th>Reference Missions</th>
<th>Apogee Altitude (km)</th>
<th>Perigee Altitude (km)</th>
<th>Inclination (deg)</th>
<th>RAAN (deg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-Sigma Requirement (Min, Target, Max)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-Sigma Prediction (Min, Mean, Max)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Actual</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: deg = degrees, km = kilometers

11.1.6.6 The Offeror shall provide technical evaluation of impacts to Orbital Injection Accuracy criteria due to secondary objectives, not required by the NROL-87 and Rideshare IRDs, for evaluation by the Government, as proposed under Attachment 5, paragraph 7.2.2.5. If the proposed secondary objectives do not impact this sub-factor, the Offeror shall provide historical evidence or detailed supporting rationale.

11.1.7 SUB-FACTOR 4: MASS-TO-ORBIT

11.1.7.1 The Offeror shall provide a detailed description of the mass-to-orbit capability associated with the proposed launch vehicle system for the NROL-87 mission based on launching from the Western Range for the Target and Accuracy Requirements in Table 11-1. The Offeror shall provide an analysis and a description of the methodology used to generate the final mass-to-orbit for the NROL-87 mission. At a minimum, the launch vehicle shall have the capability of injecting the Total Mass, described in Table 11-5, to the Target Requirements defined on Table 11-1. This analysis and methodology shall be based on either demonstrated flight performance or engineering data.

11.1.7.2 The Offeror shall fill in the vehicle specific payload equivalent mass values in Table 11-4. The Offeror shall provide the upper stage performance margin to the NROL-87 mission profiles included in the proposal with the Total Mass as defined in Table 11-4. The “Max SV Mass Used” in Table 11-4 shall be greater than or equal to the SV total mass as indicated in the NROL-87 IRD with the appropriate assumptions for the launch range chosen by the Offeror. The Offeror shall also provide the performance reserves as specified below.

- a. 3-sigma Flight Performance Reserve value (defined as 99.865% probability at 50% confidence) calculated by Monte Carlo methodology with a minimum of 10,125 runs performed to the NROL-87 profiles included in the proposal with the Total Mass as defined in Table 11-4
- b. NRO/OSL Reserve (defined as the sum of 2% of the proposed launch system performance capability to the reference orbit in Table 11-1 with Orbital Debris Mitigation
Standard Practice (ODMSP) compliance plus 75 pounds mass (lbm) of upper stage dry mass for instrumentation reserve, converted to upper stage propellant equivalent mass.

c. Description and quantification of any additional reserves held

d. Any additional performance margin

Table 11-5: Mass-to-Orbit

<table>
<thead>
<tr>
<th>Description</th>
<th>Mass</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max SV Mass Used</td>
<td></td>
<td>lbs.</td>
</tr>
<tr>
<td>Rideshare (See Note 1)</td>
<td></td>
<td>lbs.</td>
</tr>
<tr>
<td>Total Mass</td>
<td></td>
<td>lbs.</td>
</tr>
</tbody>
</table>

Note 1: Section 11.2.3.8 of the Instruction for Offerors provides Rideshare Mass Assumptions

11.1.7.3 The Offeror shall fill in the performance reserves in Table 11-6. The Offeror shall provide the 3-sigma Flight Performance Reserve value (defined as 99.865% probability at 50% confidence) calculated by Monte Carlo methodology with a minimum of 10,125 runs performed to the NROL-87 Target Requirements detailed in Table 11-1 with the Total Mass as defined in Table 11-5. The Offeror shall provide description and quantification of any additional reserves held for the sole use of the LVC. The Offeror shall provide impacts due to the mission design decisions not required by the NROL-87 IRD for evaluation by the Government.

Table 11-6 Mass-to-Orbit

<table>
<thead>
<tr>
<th>Description</th>
<th>Mass</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-sigma Flight Performance Reserve</td>
<td></td>
<td>lbs</td>
</tr>
<tr>
<td>Additional LVC Reserves</td>
<td></td>
<td>lbs</td>
</tr>
<tr>
<td><strong>Total Excess Margin Available to NROL-87 Based on Proposed Mission Profile</strong></td>
<td></td>
<td>lbs</td>
</tr>
</tbody>
</table>

11.1.7.4 The Offeror shall provide the planned NROL-87 Mission Profile including upper stage disposal approach (Orbital Debris Mitigation Standard Practices compliance is not waiverable). The mission profile shall include the significant sequence of events to include times with respect to liftoff. At a minimum, the sequence of events shall include the following mission profile events listed below (a-j). If event is not applicable, the Offeror shall provide supporting rational.

a. First stage engine start
b. Solid rocket motor burnout and jettison sequence (if applicable)
c. First stage engine cutoff and separation
d. Payload fairing jettison
e. Upper stage engine burn ignition(s), cutoff(s) and coast time(s)
f. SV separation
g. Auxiliary SV separation
h. Initiation of upper stage CCAMs
i. Upper stage disposal initiation
j. End of mission for upper stage, where end of mission is defined as the completion of passivation with no further planned maneuvers, or through upper stage impact after controlled reentry

Additionally, the Offeror shall provide orbital parameters (as defined in Table 11-1) of the SV at separation (including the effects of separation ΔV).

11.1.7.5 The Offeror shall provide methodology and results demonstrating ≥ 90% probability of success, utilizing the Monte Carlo analysis with a minimum of 10,125 runs performed, for completing the planned upper stage disposal (ODMSP compliance is not waiverable).

11.1.7.6 The Offeror shall provide data for any portion of the NROL-87 mission profile that has been flight demonstrated (T-0 to disposal burn) by the proposed or current family of launch vehicle system. Examples of data could include a table of demonstrated burn durations vs. planned burn durations; demonstrated coast durations vs. planned; re-entries achieved vs. planned; etc. The Offeror shall also identify on which flight the mission profile portion was demonstrated. The Offeror shall identify any portion of the mission profile that has not yet been flight demonstrated by proposed or current family of launch vehicle system. Undemonstrated portions of a mission profile may include, but are not specifically limited to:

a. Total proposed mission duration from launch to End of Mission is greater than 10 minutes longer than a previously flown mission
b. Number of proposed upper stage engine relights is greater than previously flown
c. Coast duration between upper stage engine relights is greater than 5 minutes from a previously flown mission
d. Booster or upper stage throttle settings outside the range of have not been previously flown throttle settings
e. Proposed CCAM or upper stage disposal solution have not been previously flown (per EELV SPRD, Rev. A)
f. Radiation environments not previously demonstrated

11.1.7.6.1 If any of the Offeror’s previous flights do not demonstrate portions of the NROL-87 mission profile to include, but not limited to 11.1.7.6 a–f, then the Offeror shall provide a detailed engineering and risk analysis of the affected launch vehicle subsystems and components, and any risks or limiting factors associated with the design or configuration of the affected
subsystems. The Offeror shall provide a mitigation approach that addresses the identified risks associated with the undemonstrated portion of the proposed mission profile.

11.1.7.7 The Offeror shall provide the ground trace and instantaneous impact point trace through end of mission or through upper stage impact if conducting a controlled reentry, with identification of nominal jettisoned body impacts. The nominal jettisoned body impacts shall occur over water. Nominal jettisoned bodies include those planned under a controlled recovery operation. If the Offeror plans to de-orbit the upper stage, they shall provide the impact ellipse. The upper stage reentry location shall be in a broad ocean area. Casualty expectation value, if applicable, and supporting analysis including mission reliability and failure scenarios shall be provided.

11.1.7.8 The Offeror shall provide historical data, from liftoff launch through upper stage disposal, on the final mission design trajectory predictions and flight data for mission profiles (including sequence of events and PL orbital parameters at separation) and for vehicle acceleration comparison plots for the four most recent launches (as of final RFP posted date) of a launch vehicle system similar to the proposed launch vehicle system, or as many as have been launched if fewer than four launches have taken place. Individual acceleration plots shall be provided for each burn of each stage. If the launch included a controlled reentry of the upper stage, the final mission design prediction for impact location and impact point from flight data estimated after all propulsive events shall be provided. If historical flight data does not corroborate predictions, the Offeror shall provide detailed supporting rationale to explain differences.

11.1.7.9 The Offeror shall provide technical evaluation of impacts to Mass-to-Orbit criteria due to secondary objectives, not required by the NROL-87 and Rideshare IRDs, for evaluation by the Government, as proposed under Attachment 5, paragraph 7.2.2.5. If the proposed secondary objectives do not impact this sub-factor, the Offeror shall provide historical evidence or detailed supporting rationale.

11.2 VOLUME Vb L-87 FACTOR 5: PRICE

11.2.1 All dollar amounts provided shall be rounded to the nearest dollar. All labor rates shall be rounded to the nearest dollar.

11.2.2 The Offeror shall provide their proposed price for the launch service allocated to categories shown in Table 11-6. This allocation shall conform to the following WBS element to CLIN mapping, and PWS paragraph to CLIN mapping:

a. CLIN 2000, Launch Vehicle Production, consists of WBS elements 1.6, 1.8.1.1, 1.8.1.2, 1.8.1.3, 1.8.2.1, 1.8.2.2, 1.8.3, 1.8.4, 1.8.5, 1.8.6, 1.8.7, 1.9, and 1.10, and all subsections therein; and consists of PWS paragraph 3.3, 3.5.4 and all subsections therein.
c. CLIN 2002 Launch Ops /Spaceflight Worthiness Certification, consists of WBS elements 1.1.1, 1.2, 1.3, 1.5.1, 1.5.2, 1.5.3, and 1.7, and all subsections therein; and consists of PWS paragraphs 3.1, 3.2, 3.5 (except 3.5.4), and 3.6, and all subsections therein.

d. CLIN 2100, Quick Reaction and Anomaly Resolution, the maximum number of 25,000 hours consists of PWS paragraph 3.7, and all subsections therein.

Table 11-6: NROL-87 Total Evaluated Price Calculation

<table>
<thead>
<tr>
<th>MISSION</th>
<th>CLIN</th>
<th>DESCRIPTION</th>
<th>CONTRACT TYPE</th>
<th>TOTAL PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>NROL-87</td>
<td>2000</td>
<td>Launch Vehicle Production Service</td>
<td>FFP</td>
<td></td>
</tr>
<tr>
<td>NROL-87</td>
<td>2001</td>
<td>Mission Integration</td>
<td>FFP</td>
<td></td>
</tr>
<tr>
<td>NROL-87</td>
<td>2002</td>
<td>Launch Ops / Spaceflight Worthiness Certification</td>
<td>FFP</td>
<td></td>
</tr>
<tr>
<td>NROL-87</td>
<td>2100</td>
<td>Quick Reaction and Anomaly Resolution – 25,000 max hours</td>
<td>FFP</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rental Equivalency of Government Property</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Total Evaluated Price (TEP)</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

12  ANNEX 3: SILENTBARKER

12.1  VOLUME IVc SILENTBARKER FACTOR 3: PERFORMANCE

12.1.1 This volume addresses the Offeror’s technical approach and solution for meeting the Government’s requirements for each Performance sub-factor. The Offeror shall describe their proposed approach to meeting the requirements of each sub-factor. Offeror responses will be evaluated against the Performance criteria defined in Attachment 6, Evaluation Criteria, Paragraph 12.

12.1.2 Reserved

12.1.3 The Offeror shall provide proposal responses to the Government unclassified to the greatest extent possible. If classified information is required, the Offeror shall deliver it in accordance with the Security Classification Guide (SCG). All classified material shall be delivered in an Addendum to prevent entire responses to factors from unnecessarily requiring classification.

12.1.4 SUB-FACTOR 1: ORBITAL ACCURACY

12.1.4.1 The Offeror shall complete the Proposed SILENTBARKER 3-Sigma Injection Accuracy column in Table 12-1 for the proposed launch vehicle system of the SILENTBARKER
mission and use the stated target as the requirement. 3-sigma for Injection Accuracy is defined as 99.73% probability at 50% confidence.

Table 12-1: SILENTBARKER Orbit Injection Target and Accuracy Requirements

<table>
<thead>
<tr>
<th>Parameter (1)</th>
<th>Orbit Injection Target Requirement</th>
<th>Minimum Accuracy Requirement</th>
<th>Maximum Accuracy Requirement</th>
<th>Proposed SILENTBARKER 3-sigma Injection Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apogee Radius (km)</td>
<td>42,464</td>
<td>-80</td>
<td>+80</td>
<td></td>
</tr>
<tr>
<td>Perigee Radius (km)</td>
<td>41,864</td>
<td>-80</td>
<td>+80</td>
<td></td>
</tr>
<tr>
<td>Eccentricity</td>
<td>0.00712</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Inclination (deg)</td>
<td>0.0</td>
<td>-0.1</td>
<td>+0.1</td>
<td></td>
</tr>
<tr>
<td>Geostationary Location (degrees Longitude)</td>
<td>105° East</td>
<td>-0.1</td>
<td>+0.1</td>
<td></td>
</tr>
</tbody>
</table>

Note 1: Orbit parameters are defined as osculating orbit parameters at issuance of separation command in true-of-date (TOD) coordinate frame using WGS84 EGM 96 for the earth’s gravitational model.

12.1.4.2 The Offeror shall provide a detailed description of their approach to meet all orbital injection targets and accuracy requirements described in Table 12-1. The description shall provide clear linkages between the approach to meet requirements and the demonstrated performance of the proposed or current family of launch vehicle system. The description shall also include the following:

a. Identification of the launch vehicle system models utilized in the Monte Carlo analysis. Provide a detailed description of the proposed launch vehicle configuration and specific block or version including, but not limited to, payload fairing configuration and engine version. Provide any model changes required to meet the proposed launch vehicle configuration and impacts of these changes to the Monte Carlo results.

b. A detailed description of the Monte Carlo used to establish the injection accuracies from Table 12-1.

c. A minimum of 10,125 runs must be performed.

d. Complete Table 12-2 with a list of all dispersions used in the methodology for establishing the injection accuracies from Table 12-1, including justifications in a separate narrative paragraph.

e. Provide risk mitigation approach for any new or undemonstrated launch vehicle capabilities that impact the Monte Carlo analysis.

12.1.4.3 Dispersions are defined as variations on performance and navigation input parameters (e.g., thrust, Isp, sensor bias/scale factors, etc.) used to generate injection accuracy...
and separation parameter results. Dispersions shall be listed in Table 12-2 with required data to describe the dispersions used, including statistical distribution type (e.g., Gaussian, uniform).

**Table 12-2: Dispersions List**

<table>
<thead>
<tr>
<th>Dispersion</th>
<th>-3 sigma value</th>
<th>Nominal</th>
<th>+3 sigma value</th>
<th>Statistical Distribution Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parameter (subscript i)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parameter 2 (subscript i=n)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

12.1.4.4 The Offeror shall identify if a Geosynchronous Earth Orbit (GEO) direct inject mission profile has not yet been flight demonstrated by proposed or launch vehicle system.

12.1.4.5 If none of the Offeror's previous flights have demonstrated a mission profile similar to SILENTBARKER, then the Offeror shall provide a detailed engineering and risk analysis of the launch vehicle subsystems and components that would impact orbital insertion accuracy, and any risks or limiting factors associated with the design or configuration of the affected subsystems. The Offeror shall provide a mitigation approach that addresses the identified risks associated with the undemonstrated guidance, navigation, and insertion to GEO direct ascending node.

12.1.4.6 The Offeror shall provide a completed Table 12-3, Historical Orbital Injection Accuracy, for each of the two most recent direct inject to GEO launches (as of final RFP posted date) of a launch vehicle system similar to the proposed launch vehicle system. If the launch history does not include two direct inject to GEO launches, then the Offeror shall complete Table 12-3 with data from as many long duration launches as flown and supplement with data for the most recent launches (as of final RFP posted date). Historical launches should not include those that had a burn-to-depletion mission design for spacecraft injection. The Offeror shall provide detailed supporting rationale behind any changes to the dispersions or methodology used in generating the predicted accuracies for either the direct inject to GEO launches or the most recent launches (as of final RFP posted date).
Table 12-3: Historical Orbital Injection Accuracy

<table>
<thead>
<tr>
<th>Reference Missions</th>
<th>Apogee Altitude (km)</th>
<th>Perigee Altitude (km)</th>
<th>Inclination (deg)</th>
<th>Argument of Perigee (deg)</th>
<th>RAAN (deg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-Sigma Requirement (Min, Target, Max)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-Sigma Prediction (Min, Mean, Max)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Actual</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: deg = degrees, km = kilometers

12.1.4.7 The Offeror shall provide technical evaluation of impacts to Orbital Injection Accuracy criteria due to secondary objectives, not required by the NROL-107 IRD, for evaluation by the Government, as proposed under Attachment 5, paragraph 7.2.2.5. If the proposed secondary objectives do not impact this sub-factor, the Offeror shall provide historical evidence or detailed supporting rationale.

12.1.5 SUB-FACTOR 2: MASS-TO-ORBIT

12.1.5.1 The Offeror shall provide a detailed description of the mass-to-orbit capability associated with the proposed launch vehicle system for the SILENTBARKER mission based on launching from the Eastern Range for the Target and Accuracy Requirements in Table 12-1. The Offeror shall provide an analysis and a description of the methodology used to generate the final mass-to-orbit for the SILENTBARKER mission. At a minimum, the launch vehicle shall have the capability of injecting the Total Mass, described on Table 12-4, to the Target Requirements defined on Table 12-1. This analysis and methodology shall be based on either demonstrated flight performance or engineering data.

12.1.5.2 The Offeror shall fill in the vehicle specific payload equivalent mass values in Table 12-4. The Offeror shall provide the upper stage performance margin to the SILENTBARKER Target Requirements detailed in Table 12-1 with the Total Mass as defined in Table 12-4. The “Max SV Mass Used” in Table 12-4 shall be greater than or equal to SV total mass indicated in the NROL-107 IRD. The Offeror shall also provide the performance reserves as specified below.

a. 3-sigma Flight Performance Reserve value (defined as 99.865% probability at 50% confidence) calculated by Monte Carlo methodology with a minimum of 10,125 runs performed to the SILENTBARKER Target Requirements detailed in Table 12-1 with the Total Mass as defined in Table 12-4

b. NRO/OSL Reserve (defined as the sum of 2% of the proposed launch system performance capability to the target orbit in Table 12-1 with Orbital Debris Mitigation Standard Practice (ODMSP) compliance plus 75 pounds mass (lbfm) of upper stage dry mass for instrumentation reserve, converted to upper stage propellant equivalent mass)
c. Description and quantification of any additional reserves held

d. Any additional performance margin

<table>
<thead>
<tr>
<th>Description</th>
<th>Mass</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max SV Mass Used (See Note 1)</td>
<td></td>
<td>lbs.</td>
</tr>
<tr>
<td>Total Mass</td>
<td></td>
<td>lbs.</td>
</tr>
</tbody>
</table>

Note 1: The SV total mass represents the mass of the SV, the SV provided separation system, and the SV provided adapter to interface with the LV from the SV side of the Standard Interface Plane (SIP) as defined in the SIS.

12.1.5.3 The Offeror shall provide the planned SILENTBARKER Mission Profile including upper stage disposal approach. The mission profile shall include the proposed launch site and significant sequence of events to include times with respect to liftoff. At a minimum, the sequence of events shall include the following mission profile events listed below (a-k). If event is not applicable, the Offeror shall provide supporting rational.

a. First stage engine start
b. Solid rocket motor burnout and jettison sequence (if applicable)
c. First stage engine cutoff and separation
d. Payload fairing jettison
e. Upper stage engine burn ignition(s), cutoff(s) and coast time(s)
f. SV separation
g. Auxiliary SV separation
h. Initiation of upper stage CCAMs
i. Upper stage disposal initiation
j. End of mission for upper stage, where end of mission is defined as the completion of passivation with no further planned maneuvers, or through upper stage impact after controlled reentry
k. Additionally, the Offeror shall provide the orbital parameters (as defined in Table 12-1) of the SV at the separation event (not including the effects of separation ΔV).

12.1.5.4 The Offeror shall provide methodology and results demonstrating ≥ 90% probability of success, utilizing the Monte Carlo analysis with a minimum of 10,125 runs performed, for completing the planned upper stage disposal (ODMSP compliance is not waiverable).

12.1.5.5 The Offeror shall provide data for any portion of the SILENTBARKER mission profile that has been flight demonstrated (T-0 to disposal burn) by the proposed or current family of launch vehicle system. Examples of data could include a table of demonstrated burn durations vs. planned burn durations; demonstrated coast durations vs. planned; re-entries achieved vs. planned; etc. The Offeror shall also identify on which flight the mission profile portion was
demonstrated. The Offeror shall identify any portion of the mission profile that has not yet been flight demonstrated by proposed or current family of launch vehicle system. Undemonstrated portions of a mission profile may include, but are not specifically limited to:

- a. Total proposed mission duration from launch to End of Mission is greater than 10 minutes longer than a previously flown mission
- b. Number of proposed upper stage engine relights is greater than previously flown
- c. Coast duration between upper stage engine relights is greater than 5 minutes from a previously flown mission
- d. Booster or upper stage throttle settings outside the range of have not been previously flown throttle settings
- e. Proposed CCAM or upper stage disposal solution have not been previously flown (per EELV SPRD, Rev. A)
- f. Radiation environments not previously demonstrated

12.1.5.1 If any of the Offeror’s previous flights do not demonstrate portions of the SILENTBARKER mission profile to include, but not limited to 12.1.2.6a–f, then the Offeror shall provide a detailed engineering and risk analysis of the affected launch vehicle subsystems and components, and any risks or limiting factors associated with the design or configuration of the affected subsystems. The Offeror shall provide a mitigation approach that addresses the identified risks associated with the undemonstrated portion of the proposed mission profile.

12.1.5.6 The Offeror shall provide the ground trace and instantaneous impact point trace through end of mission or through upper stage impact if conducting a controlled reentry, with identification of nominal jettisoned body impacts. The nominal jettisoned body impacts shall occur over water. Nominal jettisoned bodies include those planned under a controlled recovery operation. If the Offeror plans to de-orbit the upper stage, they shall provide the impact ellipse. The upper stage reentry location shall be in a broad ocean area. Casualty expectation value, if applicable, and supporting analysis including mission reliability and failure scenarios shall be provided.

12.1.5.7 The Offeror shall provide historical data, from liftoff launch through upper stage disposal, on the final mission design trajectory predictions and flight data for mission profiles (including sequence of events and PL orbital parameters at separation) and for vehicle acceleration comparison plots for the four most recent launches (as of final RFP posted date) of a launch vehicle system similar to the proposed launch vehicle system, or as many as have been launched if fewer than four launches have taken place. Individual acceleration plots shall be provided for each burn of each stage. If historical flight data does not corroborate predictions, the Offeror shall provide detailed supporting rationale to explain differences.

12.1.5.8 The Offeror shall provide technical evaluation of impacts to Mass-to-Orbit criteria due to secondary objectives, not required by the NROL-107 IRD, for evaluation by the Government, as proposed under Attachment 5, paragraph 7.2.2.5. If the proposed secondary objectives do not impact this sub-factor, the Offeror shall provide historical evidence or detailed supporting rationale.
12.1.6 SUB-FACTOR 3: LONG COAST
12.1.6.1 The Offeror shall provide an approach to conduct the SILENTBARKER extended duration GEO mission which details the following, but not specifically limited to:
   a. In-flight propellant performance management
   b. Propellant re-pressurization following a long coast period and secondary or tertiary burn
   c. Reaction control system propellant management during thermal conditioning rolls
   d. Managing in-flight electrostatic discharge in order to mitigate the risk of catastrophic discharge in areas of flight prone to magnetosphere sub-storms
   e. Complying with in-flight battery power requirements to include an upper stage extended battery configuration as necessary
   f. Communication
   g. Meeting thermal requirements
12.1.6.2 The Offeror shall provide technical evaluation of impacts to the Long Coast criteria due to secondary objectives, not required by the NROL-107 IRD, for evaluation by the Government, as proposed under Attachment 5, paragraph 7.2.2.5. If the proposed secondary objectives do not impact this sub-factor, the Offeror shall provide historical evidence or detailed supporting rationale.

12.1.7 SUB-FACTOR 4: LAUNCH OPERATIONS
12.1.7.1 The Offeror shall provide a Launch Operations CONOPS which includes a description of the proposed launch operations flow from the time the Government provides the SILENTBARKER SV to the Offeror as Government property for encapsulation through liftoff, to include any contingency procedures.
12.1.7.2 The Offeror shall provide technical rationale for CONOP acceptability, appropriate approval documentation from the launch base range, and graphic representation of the proposed CONOPS for Sub-factor 4, Launch Operations. The Offeror shall include the details of the Launch Operations CONOPS schedules in the response for Factor 4, Schedule.
12.1.7.3 The Offeror shall provide a Launch Operations CONOPS which includes the SV processing and encapsulation plans which are oriented to the proposed processing facility for an Eastern Range solution.
12.1.7.4 The Offeror shall provide technical evaluation of impacts to Launch Operations criteria due to secondary objectives, not required by the NROL-107 IRD, for evaluation by the Government, as proposed under Attachment 5, paragraph 7.2.2.5. If the proposed secondary objectives do not impact this sub-factor, the Offeror shall provide historical evidence or detailed supporting rationale.

12.1.8 SUB-FACTOR 5: CONTAMINATION MITIGATION
12.1.8.1 The Offeror shall describe their approach to meeting the SV contamination requirements, which include the following elements:
12.1.8.1.1 The Offeror shall satisfy NROL-107 IRD requirements specified in IRD paragraph 3.5.4 to provide a continuous Space Vehicle Instrumentation Purge (SVIP).

12.1.8.1.2 The Offeror shall satisfy the requirement to provide continuous PLF conditioned air, specified in SIS Rev B, paragraph 3.3.2.

12.1.8.1.3 The Offeror shall satisfy NROL-107 IRD requirement specified in IRD paragraph 3.2.3 such that SV particulate contamination shall not exceed 1% surface obscuration.

12.1.8.1.4 The Offeror shall satisfy NROL-107 IRD specified in IRD paragraph 3.2.3 such that SV molecular contamination shall not exceed 150 angstroms (0.1 mg/ft2).

12.1.8.1.5 The Offeror shall provide technical evaluation of impacts to Contamination Mitigation criteria due to secondary objectives, not required by the NROL-107 IRD, for evaluation by the Government, as proposed under Attachment 5, paragraph 7.2.2.5. If the proposed secondary objectives do not impact this sub-factor, the Offeror shall provide historical evidence or detailed supporting rationale.

12.2 VOLUME Vc SILENTBARKER FACTOR 5: PRICE

12.2.1 All dollar amounts provided shall be rounded to the nearest dollar. All labor rates shall be rounded to the nearest dollar.

12.2.2 The Offeror shall provide their proposed price for the launch service allocated to categories shown in Table 12-6. This allocation shall conform to the following WBS element to CLIN mapping, and PWS paragraph to CLIN mapping:

- a. CLIN 3000, Launch Vehicle Production, consists of WBS elements 1.6, 1.8.1.1, 1.8.1.2, 1.8.1.3, 1.8.2.1, 1.8.2.2, 1.8.3, 1.8.4, 1.8.5, 1.8.6, 1.8.7, 1.9, and 1.10, and all subsections therein; and consists of PWS paragraph 3.3, 3.5.4 and all subsections therein.
- b. CLIN 3001, Mission Integration/Launch Ops /Spaceflight Worthiness Certification, consists of WBS elements 1.1.1, 1.2, 1.3, 1.5.1, 1.5.2, 1.5.3, and 1.7, and all subsections therein; and consists of PWS paragraphs 3.1, 3.2, 3.4, 3.5 (except 3.5.4), and 3.6, and all subsections therein.
- c. CLIN 3002, Mission Unique: consists of PWS paragraphs 3.8.
- d. CLIN 3100, Quick Reaction and Anomaly Resolution, the maximum number of 25,000 hours consists of PWS paragraph 3.7, and all subsections therein.

Table 12-6: SILENTBARKER Total Evaluated Price Calculation

<table>
<thead>
<tr>
<th>MISSION</th>
<th>CLIN</th>
<th>DESCRIPTION</th>
<th>CONTRACT TYPE</th>
<th>TOTAL PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>SILENT BARKER</td>
<td>3000</td>
<td>Launch Vehicle Production Service</td>
<td>FFP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3001</td>
<td>Mission Integration / Launch Ops / Spaceflight Worthiness Certification</td>
<td>FFP</td>
<td></td>
</tr>
</tbody>
</table>
13 ANNEX 4: SBIRS GEO-5

13.1 VOLUME IVd SBIRS GEO-5 FACTOR 3: PERFORMANCE

13.1.1 This volume addresses the Offeror’s technical approach and solution for meeting the Government’s requirements for each Performance sub-factor. The Offeror shall describe their proposed approach to meeting the requirements of each sub-factor. Offeror responses will be evaluated against the Performance criteria defined in Attachment 6, Evaluation Criteria, Paragraph 13.

13.1.2 The Offeror shall provide proposal responses to the Government unclassified to the greatest extent possible. If classified information is required, the Offeror shall deliver it in accordance with the Security Classification Guide (SCG). All classified material shall be delivered in an Addendum to prevent entire responses to factors from unnecessarily requiring classification.

13.1.3 Reserved

13.1.4 Reserved

13.1.5 SUB-FACTOR 1: ORBITAL ACCURACY

13.1.5.1 The Offeror shall provide a detailed description of their approach to meet all Geosynchronous Transfer Orbit Parameters (orbital injection targets and accuracy requirements) described in Table 13-1 below (IRD 0080, Table 3.1.4) from Cape Canaveral Air Force Station. The description shall provide clear linkages between the approach to meet requirements and the demonstrated performance of the proposed or current family of launch vehicle system. The description shall also include the following:

a. Identification of the launch vehicle system models utilized in the Monte Carlo analysis. Provide a detailed description of the proposed launch vehicle configuration and specific block or version including, but not limited to, payload fairing configuration and engine version. Provide any model changes required to meet the proposed launch vehicle configuration and impacts of these changes to the Monte Carlo results.

b. A detailed description of the Monte Carlo used to establish the injection accuracies from Table 13-1. A minimum of 10,125 runs must be performed. Complete Table 13-2 with a list of all dispersions used in the methodology for establishing the injection accuracies from Table 13-1, including justifications in a separate narrative paragraph.
c. Provide risk mitigation approach for any new or undemonstrated launch vehicle capabilities that impact the Monte Carlo analysis.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Nominal Value</th>
<th>3-Sigma (±)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perigee Altitude (1)</td>
<td>193 km (104 nm)</td>
<td>7.4 km (4 nm)</td>
</tr>
<tr>
<td>Apogee Altitude (2)</td>
<td>35,786 km (19323 nm)</td>
<td>130 km (70 nm)</td>
</tr>
<tr>
<td>Orbit Inclination (3)</td>
<td>≤ 27 degrees</td>
<td>0.1 degrees</td>
</tr>
<tr>
<td>Argument of Perigee (4)</td>
<td>178 degrees</td>
<td>0.3 degrees</td>
</tr>
<tr>
<td>RAAN (5)</td>
<td>300 to 340 degrees</td>
<td>0.75 degrees</td>
</tr>
<tr>
<td>ΔV Remaining to Reference Orbit (6)</td>
<td>≤ 1594 m/s</td>
<td>n/a</td>
</tr>
<tr>
<td>Minimum Launch Vehicle Mass to Orbit Capability (6)</td>
<td>≥ 5209 kg (11484 lbm)</td>
<td>n/a</td>
</tr>
</tbody>
</table>

Note:
(1) Perigee altitude is specified such that the 3-sigma low meets a minimum perigee injection altitude of 185 km (100nm) when the EELV SIS GTO perigee injection uncertainty of ± 4 nm is accounted for. There is no constraint on the maximum perigee injection altitude with the exception that the resulting injection orbit still comply with the minimum performance specified in Table 13-1.
(2) Nominal apogee altitude set to geosynchronous (35786 km), but could be coordinated to be biased 50-100 km above/below geosynchronous to minimize conjunctions with objects in the GEO belt. Maximum apogee altitude 35916 km.
(3) Inclination – The LVP will utilize excess booster performance to reduce the injection inclination to minimize the delta-velocity (ΔV) remaining to a reference orbit. The reference orbit is a geosynchronous orbit with an inclination of 5.2° and with a RAAN equivalent to the injection RAAN. The final target injection inclination will be finalized 90 days prior to launch.
(4) Argument of Perigee – The earth central angle from the ascending node to the perigee in the direction of the SV motion
(5) Right Ascension of Ascending Node (RAAN) – The angle from the Vernal Equinox to the ascending node. The ascending node is the point where the SV passes through the equatorial plane moving from south to north. The acceptable range of RAAN depends upon the launch year as shown. The range of target RAAN values will be selected from within the range specified above as part of the final mission definition.
(6) The ΔV Remaining to Reference Orbit is the delta-velocity necessary to obtain the reference orbit from the injection orbit. The reference orbit is a geosynchronous orbit with an inclination of 5.2° and with a RAAN equivalent to the injection RAAN. An example injection orbit that meets the ≤ 1594 m/s constraint is: 193 km perigee altitude, 35786 apogee altitude, with inclination of 20.65°.

<table>
<thead>
<tr>
<th>Dispersion</th>
<th>-3 sigma value</th>
<th>Nominal</th>
<th>+3 sigma value</th>
<th>Statistical Distribution Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parameter (subscript i)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parameter 2 (subscript i=n)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
PRE-DECISIONAL

13.1.5.2 The Offeror shall provide the range of SV inclination that the Offeror’s launch vehicle can achieve for the SBIRS GEO-5 mission and a detailed description of the analytical methodology used to determine the range of SV inclination while meeting all other transfer orbit parameters specified in IRD 0080, Table 3.1.4-1 (perigee, apogee, etc).

13.1.5.3 The Offeror shall provide a completed Table 13-3, Historical Orbital Injection Accuracy, for each of the four most recent (as of final RFP posted date) Geosynchronous Transfer Orbit (GTO) launches of a launch vehicle system similar to the proposed launch vehicle system. If the launch history does not include four GTO launches, then the Offeror shall complete Table 13-3 with data from as many GTO launches as flown and supplement with data for the most recent launches (as of final RFP posted date). Historical launches should not include those that had a burn-to-depletion mission design for spacecraft injection. The Offeror shall provide detailed supporting rationale behind any changes to the dispersions (Table 13-2) or methodology used in generating the predicted accuracies for either the historical GTO launches or the most recent launches (as of final RFP posted date).

Table 13-3: Historical Orbital Injection Accuracy

<table>
<thead>
<tr>
<th>Reference Missions</th>
<th>Apogee Altitude (km)</th>
<th>Perigee Altitude (km)</th>
<th>Inclination (deg)</th>
<th>Argument of Perigee (deg)</th>
<th>RAAN (deg)</th>
<th>Deployment Longitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-Sigma Requirement (Min, Target, Max)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-Sigma Prediction (Min, Mean, Max)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Actual</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: deg = degrees, km = kilometers

13.1.5.4 If the vehicle configuration proposed by the Offeror, including vehicle hardware and software changes, has not demonstrated a mission profile similar to the SBIRS GEO-5 mission profile then the Offeror shall provide a detailed engineering and risk analysis of the launch vehicle subsystems and components that would impact orbital insertion accuracy, and any risks or limiting factors associated with the design or configuration of the affected subsystems. The Offeror shall provide a mitigation approach that addresses the risks associated with the undemonstrated configuration and the impact of that undemonstrated configuration on guidance, navigation, and target orbit insertion accuracy.

13.1.5.5 The Offeror shall provide technical evaluation of impacts to Orbital Accuracy criteria due to secondary objectives not required by the SBIRS GEO-5 IRD for evaluation by the Government, as proposed under Attachment 5, paragraph 7.2.2.5. If the proposed secondary objectives do not impact this sub-factor, the Offeror shall provide historical evidence or detailed supporting rationale.

13.1.6 SUB-FACTOR 2: THERMAL ENVIRONMENT
The Offeror shall describe their approach to meeting the SV prelaunch and ascent thermal requirements which include the following elements:

13.1.6.1 The Offeror shall describe their approach to meeting the SV prelaunch requirements delineated in GEO-5 IRD paragraph 3.3.8.3 (IRD 1530 and 1540) which prescribes that the Offeror shall provide continuous, controllable and monitored PLF conditioned air with the following characteristics while the SV is within the PLF, from SV/LV mate up to T-0:

- Air temperature surrounding the SV to be user selectable from 43-70 deg F (6-21 deg C) and controllable to +/- 5 deg F (+/- 3 deg C) of the user selected value with any planned outage to be approved by the SVC in advance.
- Flow velocity of the PLF air distribution system to maintain positive pressure (relative to the external PLF environment) and be less than 32 fps in all directions, without direct impingement on SV surfaces or causing billowing of Multi-Layer Insulation (MLI) blankets.
- Relative humidity to be in the range 0-60% with no condensation, 30-60% if SV access is required.
- Air cleanliness of inlet air to be Class 6.7 per ISO 14644-1 or better with HEPA filter at the point of use inlet to the PLF.
- Air hydrocarbon content to be no greater than 15 ppm total hydrocarbons reported as methane equivalent.

13.1.6.2 The Offeror shall describe their approach to meeting the ascent requirements delineated in IRD 0040 and 0050 of GEO-5 IRD paragraph 3.1.3 which prescribes that the Offeror shall preclude direct sun within Zone D of IRD Figure 3.1.3 and:

- The LV shall roll about the Xm axis at a rate of 1.0 ± 0.3 deg/sec during park orbit and transfer coasts, except during transient events described in IRD0040a
- During transient events described in IRD0040a, direct sun on the SV surfaces within Zones A and B of IRD Figure 3.1.3 shall be limited to less than 90 seconds per event

13.1.6.3 Where predicted performance is used, the Offeror shall provide a description of the analytical methodology used.

13.1.6.4 The Offeror shall provide technical evaluation of impacts to Thermal Environment criteria due to secondary objectives not required by the SBIRS GEO-5 IRD for evaluation by the Government, as proposed under Attachment 5, paragraph 7.2.2.5. If the proposed secondary objectives do not impact this sub-factor, the Offeror shall provide historical evidence or detailed supporting rationale.

**13.1.7 SUB-FACTOR 3: CONTAMINATION**

13.1.7.1 The Offeror shall describe their approach to meeting the SV contamination requirements, which include the following elements:
13.1.7.2 The Offeror shall satisfy GEO-5 IRD requirements IRD1900-1950 specified in IRD paragraph 3.3.9.4 to provide a continuous Space Vehicle Instrumentation Purge (SVIP).

13.1.7.3 The Offeror shall satisfy GEO-5 IRD requirement IRD 1530 specified in IRD paragraph 3.3.8.3 to provide continuous PLF conditioned air.

13.1.7.4 The Offeror shall satisfy GEO-5 IRD requirement IRD1800 specified in IRD paragraph 3.3.9.2 such that SV particulate contamination shall not exceed 1% surface obscuration.

13.1.7.5 The Offeror shall satisfy GEO-5 IRD requirement IRD1810 specified in IRD paragraph 3.3.9.2 such that SV molecular contamination shall not exceed 150 angstroms (0.1 mg/ft²).

13.1.7.6 The Offeror shall provide technical evaluation of impacts to Contamination criteria due to secondary objectives not required by the SBIRS GEO-5 IRD for evaluation by the Government, as proposed under Attachment 5, paragraph 7.2.2.5. If the proposed secondary objectives do not impact this sub-factor, the Offeror shall provide historical evidence or detailed supporting rationale.

13.1.8 SUB-FACTOR 4: LAUNCH OPERATIONS

13.1.8.1 The Offeror shall provide a Launch Operations integrated CONOPS which includes a description of the proposed launch operations flow from the time the Government provides the SBIRS GEO-5 SV to the Offeror as Government property for encapsulation through liftoff, to include any contingency procedures.

13.1.8.2 The Offeror shall provide technical rationale for Launch Operations CONOPS acceptability, appropriate approval documentation from the launch base range, and graphical representation of the proposed CONOPS for sub-factor 4. The Offeror shall include the details of the Launch Operations CONOPS schedules in the response for Factor 4, Schedule.

13.1.8.3 The Offeror shall provide a Launch Operations CONOPS which includes the LV processing and SV/LV encapsulation plans that require cohabitating with the SV in a single bay of the Eastern Processing Facility (EPF) at Cape Canaveral Air Force Station until transport from the EPF.

13.1.8.4 The Offeror shall provide a Launch Operations CONOPS for the transportation and integration of the Encapsulated Assembly (EA) onto the LV to meet the GEO-5 IRD requirements. This includes validation of SV clocking on the LV and the ability to meet all load limitations of the SV.

13.1.8.5 The Offeror shall provide a Launch Operations Concept of Operations (CONOPS) which includes the following elements:

a. The Offeror shall provide a continuous, monitored Space Vehicle Instrumentation Purge (SVIP) satisfying GEO-5 IRD requirements IRD 1900-1950 specified in IRD paragraph 3.3.9.4.
b. The Offeror shall provide continuous, monitored PLF conditioned air/GN2 and continuously record temperature, pressure, flow rates, and particle counts of the PLF conditioned air from SV/LV mate until liftoff, and also continuously monitor and record hydrocarbon levels while the PLF Environmental Control System is supplying air/GN2 starting at SV/LV mate until changeover to PLF GN2. If internal PLF environmental conditions deviate outside requirements limits, the SVC will be notified within 30 minutes of the occurrence per GEO-5 IRD paragraph 3.3.8.3 (IRD 1520), and be provided with: 1) Time, 2) Current procedure being worked at time of requirement excursion, 3) Time flow rate violation occurred, 4) Actual flow rate at time of violation, 5) Time which flow rate was reestablished to requirement limits, 6) Flow rate after restoration, 7) Responsible technician/engineer capturing excursion.

- The Offeror’s continuous PLF conditioned air/GN2 (MIL-PRF-27401D Type 1, Grade B) shall satisfy GEO-5 IRD requirements IRD 1530 and 1540 specified in IRD paragraph 3.3.8.3, including:
  i. Air temperature surrounding the SV to be user selectable from 43º-70ºF (6º-21°C), controllable to +/- 5ºF (+/- 3°C) of the user selected value with any planned outage to be approved by the SVC in advance.
  ii. Relative humidity to be in the range 0-60% with no condensation, 30-60% if SV access is required
  iii. Flow velocity of the LF air distribution system to maintain positive pressure (relative to the external PLF environment) and be less than 32 fps in all directions, without direct impingement on SV surfaces or causing billowing of Multi-Layer Insulation (MLI) blankets.
  iv. Air cleanliness of inlet air to be Class 6.7 per ISO 14644-1 or better with HEPA filter at the point of use inlet to the PLF.
  v. Air hydrocarbon content to be no greater than 15 ppm total hydrocarbons reported as methane equivalent
c. The Offeror shall provide a telemetry path for the continuous monitoring of clampband tension from SV mate to the LV until liftoff as specified in IRD paragraph 3.1.7 (IRD0140)
d. The Offeror shall be able to support a 40-minute launch window for any day of the year
e. The Offeror shall provide real-time forward-facing video of the space vehicle separation event
f. The Offeror shall support SV battery charging at the Space Launch Complex (SLC) integration facility and pad

13.1.8.6 The Offeror shall provide technical evaluation of impacts to Launch Operations criteria due to secondary objectives not required by the SBIRS GEO-5 IRD for evaluation by the Government, as proposed under Attachment 5, paragraph 7.2.2.5. If the proposed secondary objectives do not impact this sub-factor, the Offeror shall provide historical evidence or detailed supporting rationale.
13.1.9 SUB-FACTOR 5: MASS-TO-ORBIT

13.1.9.1 The Offeror shall provide a detailed description of the mass-to-orbit capability associated with the proposed launch vehicle system for the SBIRS GEO-5 mission based on launching from the Eastern Range for the threshold target and accuracy requirements specified in GEO-5 IRD Tables 3.1.4-1 and 3.1.4-2. The Offeror shall also provide and describe the extent to which the objective target requirement of 794 meters per second delta-V remaining to the GEO-5 reference orbit can be met by the proposed launch vehicle system. The Offeror shall provide an analysis and a description of the methodology used to generate the final mass-to-orbit for the GEO-5 mission. At a minimum, the launch vehicle shall have the capability of injecting the maximum mass, described in GEO-5 IRD Table 3.2.1.2, to the threshold target requirements defined in GEO-5 IRD Tables 3.1.4-1. The analyses provided and methodology used shall be based on either demonstrated flight performance or engineering data.

Table 13-4: SV Mass Properties with PLA

<table>
<thead>
<tr>
<th>Mass Property</th>
<th>Minimum Requirement</th>
<th>Maximum Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mass*</td>
<td>9,500 lb (4309.1 kg)</td>
<td>11,484 lb (5209.1 kg)</td>
</tr>
<tr>
<td>Center of Mass</td>
<td></td>
<td></td>
</tr>
<tr>
<td>X&lt;sub&gt;M&lt;/sub&gt;</td>
<td>-73.5 in (-1866.9 mm)</td>
<td>-85.5 in (-2171.7 mm)</td>
</tr>
<tr>
<td>Y&lt;sub&gt;M&lt;/sub&gt;</td>
<td>-3.0 in (-76.2 mm)</td>
<td>+3.0 in (76.2 mm)</td>
</tr>
<tr>
<td>Z&lt;sub&gt;M&lt;/sub&gt;</td>
<td>-3.0 in (-7.62 mm)</td>
<td>+3.0 in (76.2 mm)</td>
</tr>
<tr>
<td>Moments of Inertia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I&lt;sub&gt;XX,M&lt;/sub&gt;</td>
<td>1300 slug-ft&lt;sup&gt;2&lt;/sup&gt; (1762.6 kg-m&lt;sup&gt;2&lt;/sup&gt;)</td>
<td>1900 slug-ft&lt;sup&gt;2&lt;/sup&gt; (2576.1 kg-m&lt;sup&gt;2&lt;/sup&gt;)</td>
</tr>
<tr>
<td>I&lt;sub&gt;YY,M&lt;/sub&gt;</td>
<td>6550 slug-ft&lt;sup&gt;2&lt;/sup&gt; (8880.6 kg-m&lt;sup&gt;2&lt;/sup&gt;)</td>
<td>8850 slug-ft&lt;sup&gt;2&lt;/sup&gt; (11999.0 kg-m&lt;sup&gt;2&lt;/sup&gt;)</td>
</tr>
<tr>
<td>I&lt;sub&gt;ZZ,M&lt;/sub&gt;</td>
<td>6300 slug-ft&lt;sup&gt;2&lt;/sup&gt; (8541.6 kg-m&lt;sup&gt;2&lt;/sup&gt;)</td>
<td>8500 slug-ft&lt;sup&gt;2&lt;/sup&gt; (11524.4 kg-m&lt;sup&gt;2&lt;/sup&gt;)</td>
</tr>
<tr>
<td>Products of Inertia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I&lt;sub&gt;XY,M&lt;/sub&gt;</td>
<td>-400 slug-ft&lt;sup&gt;2&lt;/sup&gt; (-542.3 kg-m&lt;sup&gt;2&lt;/sup&gt;)</td>
<td>+400 slug-ft&lt;sup&gt;2&lt;/sup&gt; (542.3 kg-m&lt;sup&gt;2&lt;/sup&gt;)</td>
</tr>
<tr>
<td>I&lt;sub&gt;XZ,M&lt;/sub&gt;</td>
<td>-400 slug-ft&lt;sup&gt;2&lt;/sup&gt; (-542.3 kg-m&lt;sup&gt;2&lt;/sup&gt;)</td>
<td>+400 slug-ft&lt;sup&gt;2&lt;/sup&gt; (542.3 kg-m&lt;sup&gt;2&lt;/sup&gt;)</td>
</tr>
<tr>
<td>I&lt;sub&gt;YZ,M&lt;/sub&gt;</td>
<td>-400 slug-ft&lt;sup&gt;2&lt;/sup&gt; (-542.3 kg-m&lt;sup&gt;2&lt;/sup&gt;)</td>
<td>+400 slug-ft&lt;sup&gt;2&lt;/sup&gt; (542.3 kg-m&lt;sup&gt;2&lt;/sup&gt;)</td>
</tr>
</tbody>
</table>

* Includes Fueled SV, PLA and harness.

Notes:
1. Moments and products of inertia are referenced to SV coordinate axis passing through its center of mass.
2. Center of mass coordinates are given in space vehicle manufacturing coordinates with the origin at the centerline of the separation ring and in the separation plane (+X<sub>m</sub> = 0.0 in).
3. Products of Inertia are calculated from the following formula: I<sub>xy</sub> = ∫xy dm. (Positive Integral)
4. SV propellants are modeled as being rigidly attached to the SV structure.

13.1.9.2 The Offeror shall fill in the vehicle specific payload equivalent mass values in Table 13-5. The Offeror shall provide the performance margin to the GEO-5 Target Requirements detailed in Table 13-1 with the maximum mass as defined in GEO-5 IRD Table 3.2.1.2. The “Max SV Mass Used” and the “Payload Adapter Mass” in Table 13-1 shall be greater than or equal to the SV total mass and PLA total mass respectively as specified in the GEO-5 IRD.
Table 13-5: Mass-to-Orbit

<table>
<thead>
<tr>
<th>Description</th>
<th>Mass</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max SV Mass Used</td>
<td></td>
<td>lbs.</td>
</tr>
<tr>
<td>Payload Adapter Mass (See Note 1)</td>
<td></td>
<td>lbs.</td>
</tr>
<tr>
<td>Rideshare (See Note 2)</td>
<td></td>
<td>lbs.</td>
</tr>
<tr>
<td>Total Mass</td>
<td></td>
<td>lbs.</td>
</tr>
</tbody>
</table>

Note 1: Payload Adapter (PLA) Mass is the mass of the PLA hardware including all associated harnesses, the separation system and attached hardware required for flight.

Note 2: Section 7.2.2.6 of the Instruction for Offerors provides Rideshare Mass Assumptions.

13.1.9.3 The Offeror shall fill in the performance reserves in Table 13-6. The Offeror shall provide the 3-sigma Flight Performance Reserve value (defined as 99.865% probability at 50% confidence) calculated by Monte Carlo methodology with a minimum of 10,125 runs performed to the GEO-5 target requirements detailed in Table 13-1 with the total mass defined in Table 13-4. The Offeror shall provide description and quantification of any additional reserves held for the sole use of the LVC. The Offeror shall provide impacts due to any mission design decisions made by the Offeror, but not required by the GEO-5 IRD, for evaluation by the Government.

Table 13-6 Mass-to Orbit Reserves

<table>
<thead>
<tr>
<th>Description</th>
<th>Mass</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-sigma Flight Performance Reserve</td>
<td></td>
<td>lbs.</td>
</tr>
<tr>
<td>Additional LVC Reserves</td>
<td></td>
<td>lbs.</td>
</tr>
<tr>
<td><strong>Total Excess Margin Available to SBIRS GEO-5 Based on Proposed Mission Profile</strong></td>
<td></td>
<td>lbs.</td>
</tr>
</tbody>
</table>

13.1.9.4 The Offeror shall provide the planned GEO-5 mission profile including upper stage disposal approach complying with Orbital Debris Mitigation Standard Practices, with which compliance is not waivable for this mission. The mission profile shall include the significant sequence of significant events to include times with respect to liftoff from CCAFS. At a minimum, the sequence of events shall include the mission profile events listed below (a-j). If an event is not applicable, the Offeror shall provide supporting rationale.

a. First stage engine start
b. Solid rocket motor burnout and jettison sequence (if applicable)
c. First stage engine cutoff and separation
d. Payload fairing jettison
e. Upper stage engine burn ignition(s), cutoff(s) and coast time(s)
f. SV separation
g. Auxiliary SV separation
h. Initiation of upper stage CCAMs
i. Upper stage disposal initiation
j. End of mission for upper stage, where end of mission is defined as the completion of passivation with no further planned maneuvers, or through upper stage impact after controlled reentry.

Additionally, the Offeror shall provide orbital parameters (as defined in Table 13-1 for the selected plane/date) of the SV at separation (including the effects of separation ∆V).

13.1.9.5 The Offeror shall provide methodology and results demonstrating ≥ 90% probability of success, utilizing the Monte Carlo analysis with a minimum of 10,125 runs performed, for completing the planned upper stage disposal (ODMSP compliance is not waiverable).

13.1.9.6 The Offeror shall provide data for any portion of the GEO-5 mission profile that has been flight demonstrated (T-0 to disposal burn) by the proposed or current family of launch vehicle system. Examples of data could include a table of demonstrated burn durations vs. planned burn durations; demonstrated coast durations vs. planned; re-entries achieved vs. planned; etc. The Offeror shall also identify on which flight the mission profile portion was demonstrated. The Offeror shall identify any portion of the mission profile that has not yet been flight demonstrated by the proposed or current family of launch vehicle system and shall provide a detailed engineering and risk analysis of the affected launch vehicle subsystems and components, and any risks or limiting factors associated with the design or configuration of the affected subsystems. The Offeror shall provide a mitigation approach that addresses the identified risks associated with the undemonstrated portion of the proposed mission profile.

13.1.9.7 The Offeror’s shall provide a detailed description of their approach for the Multi-manifest SVs, to include the (1) integration of two Government provided integrated 12U CubeSat/Dispensers for integration to the aft multi-payload carrier (AMPC), (2) AMPC to the launch vehicle and (3) launch and deployment of Multi-manifest SVs into an initial (TBD) orbit.

13.1.9.8 The Offeror shall provide CONOPS for the integration of the aft Multi-manifest SVs, which would be available at NET L-2 months in the launch processing flow. This shall include requirements from Section TBD IRD in developing the CONOPS and technical interface documentation for the integration of the aft Multi-manifest SVs.

13.1.9.9 The Offeror shall provide CONOPs and technical documentation to support installation of the Aft multi-manifest SVs on the aft end of the upper stage, not within the Encapsulated Assembly (EA), with appropriate mechanical and electrical interfaces for the dispensers. The Offeror shall provide mechanical drawings of interfaces and historical data on usage.
13.1.9.10 The Offeror shall demonstrate capability to provide environmental control of the aft Multi-manifest SVs prior to installation with a GN2 purge in addition to maintaining environments through launch processing consistent with the Rideshare Users Guide (RUG).

13.1.9.11 The Offeror shall demonstrate capability to support door open and redundant door open commands for each dispenser. The Offeror shall demonstrate ability to supply telemetry for the door open/close status of each dispenser.

13.1.9.12 The Offeror shall demonstrate capability to meet all launch environments provide in the Rideshare Users Guide (RUG).

13.1.9.13 The Offeror shall perform a nominal analysis to show that re-contact between the GEO-5, aft Multi-manifest SVs, and upper stage will not occur within 5 orbit revolutions. The Offeror shall assume two 12U (24kg) aft Multi-manifest SVs including satellite dispenser hardware, to have a total mass of 75 kg. The Offeror shall assume a relative separation velocity of 1 fps for each separation event of the aft Multi-manifest SVs.

13.1.9.14 The Offeror shall provide mitigation plans for any areas of non-compliance with SBIRS-5 and aft Multi-manifest SV IRD requirements.

13.1.9.15 The Offeror shall provide technical evaluation of impacts to Mass-to-Orbit criteria due to secondary objectives not required by the SBIRS GEO-5 IRD for evaluation by the Government, as proposed under Attachment 5, paragraph 7.2.2.5. If the proposed secondary objectives do not impact this sub-factor, the Offeror shall provide historical evidence or detailed supporting rationale.

**13.1.10 SUB-FACTOR 6: REQUIREMENT VERIFICATION**

13.1.10.1 The Offeror shall provide a detailed description of their approach and methods for formal verification of SV/LV Interface Control Document (ICD) requirements, through the provision of rationale and supporting evidence, demonstrating compliance with the requirements in the SBIRS GEO-5 IRD.

13.1.10.2 The Offeror shall provide technical evaluation of impacts to Requirement Verification criteria due to secondary objectives not required by the SBIRS GEO-5 IRD for evaluation by the Government, as proposed under Attachment 5, paragraph 7.2.2.5. If the proposed secondary objectives do not impact this sub-factor, the Offeror shall provide historical evidence or detailed supporting rationale.

**13.1.11 SUB-FACTOR 7: LOADS AND DYNAMICS**

13.1.11.1 The Offeror shall provide verification that the SV/LV loads specified in GEO-5 IRD paragraphs 3.3.3.4, 3.3.3.6 and Table 3.3.3.6 will not be violated and provide historical data showing compliance with loads during vertical/horizontal payload handling operations.
Table 13-7: Quasi-Static Limit Load Factors for Primary Structure

<table>
<thead>
<tr>
<th>Load Case Number</th>
<th>Load Case Description</th>
<th>Limit Load Factors (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Lateral</td>
</tr>
<tr>
<td>1</td>
<td>EELV Max Compression</td>
<td>0.5</td>
</tr>
<tr>
<td>2</td>
<td>EELV Max Tension</td>
<td>1.2</td>
</tr>
<tr>
<td>3</td>
<td>EELV Max Lateral</td>
<td>2.0</td>
</tr>
</tbody>
</table>

Notes:
1) Thrust and lateral are applied simultaneously. The lateral will be applied in any direction to achieve the worst load combination.
2) Positive thrust is downward.
3) SV weight includes SV Payload Adapter.

13.1.11.2 The Offeror shall provide a detailed description of their approach to meet the acoustic requirements in GEO-5 IRD paragraph 3.3.3.5. The Offeror’s approach shall address:

a. How the payload fairing acoustic environment for the GEO-5 mission is determined/predicted
b. A description of the analysis methodology used to predict or estimate acoustics in the fairing
c. The method and basis for the proposed approach to maintain the acoustics within the required levels

13.1.11.3 The Offeror shall provide a detailed description of their approach to meet the requirement for payload shock at the Standard Interface Plane (SIP) in GEO-5 IRD paragraph 3.3.3.7 and Table 3.3.3.7.

13.1.11.4 The Offeror shall provide technical evaluation of impacts to Loads and Dynamics criteria due to secondary objectives not required by the SBIRS GEO-5 IRD for evaluation by the Government, as proposed under Attachment 5, paragraph 7.2.2.5. If the proposed secondary objectives do not impact this sub-factor, the Offeror shall provide historical evidence or detailed supporting rationale.

13.2 VOLUME IVd SBIRS GEO-5 FACTOR 5: PRICE

13.2.1 All dollar amounts provided shall be rounded to the nearest dollar. All labor rates shall be rounded to the nearest dollar.

a. 13.2.2 The Offeror shall provide their proposed price for the launch service allocated to categories shown in Table 13-6. This allocation shall conform to the following WBS element to CLIN mapping, and PWS paragraph to CLIN mapping: CLIN 4000, Launch Vehicle Production, consists of WBS elements
1.6, 1.8.1.1, 1.8.1.2, 1.8.1.3, 1.8.2.1, 1.8.2.2, 1.8.3, 1.8.4, 1.8.5, 1.8.6, 1.8.7, 1.9, and 1.10, and all subsections therein; and consists of PWS paragraph 3.3, 3.5.4 and all subsections therein.

b. CLIN 4001, Mission Integration/Launch Ops /Spaceflight Worthiness Certification, consists of WBS elements 1.1.1, 1.2, 1.3, 1.5.1, 1.5.2, 1.5.3, and 1.7, and all subsections therein; and consists of PWS paragraphs 3.1, 3.2, 3.4, 3.5 (except 3.5.4), and 3.6, and all subsections therein.

c. CLIN 4002, Mission Unique: consists of PWS paragraphs 3.8.

d. CLIN 4100, Quick Reaction and Anomaly Resolution, the maximum number of 25,000 hours consists of PWS paragraph 3.7, and all subsections therein.

Table 13-8: SBIRS GEO-5 Total Evaluated Price Calculation

<table>
<thead>
<tr>
<th>MISSION</th>
<th>CLIN</th>
<th>DESCRIPTION</th>
<th>CONTRACT TYPE</th>
<th>TOTAL PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>SBIRS GEO-5</td>
<td>4000</td>
<td>Launch Vehicle Production Service</td>
<td>FFP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4001</td>
<td>Mission Integration / Launch Ops / Spaceflight Worthiness Certification</td>
<td>FFP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4002</td>
<td>Mission Unique</td>
<td>FFP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4100</td>
<td>Quick Reaction and Anomaly Resolution – 25,000 max hours</td>
<td>FFP</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rental Equivalency of Government Property</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Total Evaluated Price (TEP)</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

14 ANNEX 5: AFSPC-44

14.1 VOLUME IVe AFSPC-44 FACTOR 3: PERFORMANCE

14.1.1 This volume addresses the Offeror’s technical approach and solution for meeting the Government’s requirements for each Performance sub-factor. The Offeror shall describe their proposed approach to meeting the requirements of each sub-factor. Offeror responses will be evaluated against the Performance criteria defined in Attachment 6, Evaluation Criteria, Paragraph 14.

14.1.2 For unclassified proposal responses, the Offeror shall reference the payload as the “AFSPC-44 Payload”. If required, reference the fore payload as “Payload 1” and the aft payload as “Payload 2”.

14.1.3 The Offeror shall provide proposal responses to the Government unclassified to the greatest extent possible. If classified information is required, the Offeror shall deliver it in accordance with the Security Classification Guide (SCG). All classified material shall be
delivered in an Addendum to prevent entire responses to factors from unnecessarily requiring classification.

14.2 SUB-FACTOR 1: MISSION UNIQUE INTEGRATION

14.2.1 The Offeror shall provide CONOPS for the integration of two Payloads NET L-2 months in the launch processing flow. The following should be considered in developing the CONOPS and technical interface documentation for the integration of both payloads:

a. The Government will provide final Payload design properties, mission design constraints, and configuration to the LVC NLT Launch (L) – 12 months.

b. Both payloads will be delivered to the Offeror ready for installation onto the LV.

c. Unique security requirements are needed in the processing of the payloads.

d. During ground processing both payloads require physical access, power, and telemetry.

e. The Government will provide Mass Simulators if either of payloads are not available to support launch.

14.2.2 Offeror shall provide CONOPs and technical documentation to support installation of both payloads. The Offeror shall provide mechanical drawings of interfaces and historical data on usage.

14.2.3 Offeror shall demonstrate capability to provide environmental control of the Payloads during Launch Processing to include details for GN2 purge and contamination control.

14.2.4 Offeror shall provide a detailed description for placing both payloads into the same orbit.

14.2.5 The Offeror shall demonstrate capability to meet all launch environments provided in the Payload Platform Launch Vehicle Interface Requirements Document (PPLVIRD) section 4.1 and 4.2.

14.2.6 The Offeror shall provide a detailed description of their approach to perform deployment of both payloads with a separation time of 600s in accordance with the Payload Platform Launch Vehicle Interface Requirements Document (PPLVIRD) section 4.1 and 4.2.

14.2.7 Offeror shall perform a nominal analysis to show that re-contact between both payloads and the upper stage will not occur. The Offeror shall assume each payload has a weight of 2000kg.

14.2.8 Offeror shall provide mitigation plans for any areas of non-compliance with AFSPC-44 Payload Platform Launch Vehicle Interface Requirements Document (PPLVIRD) requirements.

14.2.9 The Offeror shall provide technical evaluation of impacts to Mission Unique criteria due to secondary objectives not required by the AFSPC-44 IRD for evaluation by the Government, as proposed under Attachment 5, paragraph 7.2.2.5. If the proposed secondary objectives do not
impact this sub-factor, the Offeror shall provide historical evidence or detailed supporting rationale.

14.3 SUB-FACTOR 2: ORBITAL ACCURACY

14.3.1 Offeror shall complete the Proposed AFSPC-44 3-Sigma Injection Accuracy column in Table 14-1 for the proposed launch vehicle system of the AFSPC-44 mission. 3-sigma for Injection Accuracy is defined as 99.73% probability at 50% confidence.

Table 14-1: AFSPC-44 Orbit Injection Target and Accuracy Requirements (see notes)

<table>
<thead>
<tr>
<th>Parameter (1)</th>
<th>Orbit Injection Target Requirement</th>
<th>Minimum Accuracy Requirement</th>
<th>Maximum Accuracy Requirement</th>
<th>Proposed 3-sigma Injection Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semi-major Axis (km)</td>
<td>42464km +/- 100km</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apogee Radius (km)</td>
<td>GEO 42464km +/- 100km</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perigee Radius (km)</td>
<td>GEO 42464km +/- 100km</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eccentricity</td>
<td>0.00025 +/- 0.0001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inclination (deg)</td>
<td>5 degrees +/- 0.025 degrees</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Argument of Perigee (deg)</td>
<td>170.0 - 190.0 deg +/- 0.25</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Right Ascension of Ascending Node (deg) (2)</td>
<td>300 - 340 degrees +/- 0.25 degrees</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note 1: Orbit parameters are defined at separation command issuance as mean orbit parameters in true-of-date (TOD) coordinate frame using WGS84 EGM 96 for the earth’s gravitational model.

Note 2: Final RAAN constants, RAAN0 and Ω defined per note 3, specified no earlier than L-45 days.

Note 3: RAAN = RAAN0 + Ωt, where RAAN = Required RAAN (deg) at SV separation (determines optimum launch time), RAAN0 = RAAN (deg) referenced to 0 GMT on first day of 30-day launch period (referenced to true-of-date (TOD) coordinate frame), Ω= Rate of change (deg/sec) of RAAN (i.e., nodal regression rate), t = time (sec) at SV separation referenced from 0 GMT on first day of 30-day launch period.

14.3.2 Offeror shall provide a detailed description of their approach to meet all orbital injection targets and accuracy requirements described in Table 14-1. The description shall provide clear
linkages between the approach to meet requirements and the demonstrated performance of the proposed or current family of launch vehicle system. The description shall also include the following:

a. Identification of the launch vehicle system models utilized in the Monte Carlo analysis. Provide a detailed description of the proposed launch vehicle configuration and specific block or version including, but not limited to, payload fairing configuration and engine version. Provide any model changes required to meet the proposed launch vehicle configuration and impacts of these changes to the Monte Carlo results.

b. A detailed description of the Monte Carlo used to establish the injection accuracies from Table 14-1.

c. A minimum of 10,125 runs must be performed.

d. Complete Table 14-2 with a list of all dispersions used in the methodology for establishing the injection accuracies from Table 14-1, including justifications in a separate narrative paragraph.

e. Provide risk mitigation approach for any new or undemonstrated launch vehicle capabilities that impact the Monte Carlo analysis.

14.3.3 Dispersions are defined as variations on performance and navigation input parameters (e.g., thrust, Isp, sensor bias/scale factors, etc.) used to generate injection accuracy and separation parameter results. Dispersions shall be listed in Table 14-2 with required data to describe the dispersions used, including statistical distribution type (e.g., Gaussian, uniform).

**Table 14-2: Dispersions List**

<table>
<thead>
<tr>
<th>Dispersion</th>
<th>-3 sigma value</th>
<th>Nominal</th>
<th>+3 sigma value</th>
<th>Statistical Distribution Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parameter (subscript i)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parameter 2 (subscript i=n)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

14.3.4 Offeror shall provide a completed Table 14-3, Historical Orbital Injection Accuracy, for each of the four most recent (as of final RFP posted date) geostationary orbit launches of a launch vehicle system similar to the proposed launch vehicle system. If the launch history does not include four geostationary orbit launches, then the Offeror shall complete Table 14-3 with data from as many geostationary orbit launches as flown and supplement with data for the most recent launches (as of final RFP posted date). Historical launches should not include those that had a burn-to-depletion mission design for spacecraft injection. The Offeror shall provide detailed supporting rationale behind any changes to the dispersions (Table 14-3) or methodology.
used in generating the predicted accuracies for either the historical geostationary orbit launches or the most recent launches (as of final RFP posted date).

14.3.5 The Offeror shall provide technical evaluation of impacts to Orbital Accuracy criteria due to secondary objectives not required by the AFSPC-44 IRD for evaluation by the Government, as proposed under Attachment 5, paragraph 7.2.2.5. If the proposed secondary objectives do not impact this sub-factor, the Offeror shall provide historical evidence or detailed supporting rationale.

Table 14-3: Historical Orbital Injection Accuracy

<table>
<thead>
<tr>
<th>Reference Missions</th>
<th>Apogee Altitude (km)</th>
<th>Perigee Altitude (km)</th>
<th>Inclination (deg)</th>
<th>Argument of Perigee (deg)</th>
<th>RAAN (deg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-Sigma Requirement (Min, Target, Max)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-Sigma Prediction (Min, Mean, Max)</td>
<td></td>
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<tr>
<td>Actual</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Notes: deg = degrees, km = kilometers

14.4 SUB-FACTOR 3: DYNAMIC ENVIRONMENTS

14.4.1 Offeror shall provide a detailed description of their approach to meet launch vehicle/space vehicle dynamic environment requirements in the Payload Platform Launch Vehicle Interface Requirements Document (PPLVIRD) paragraphs 3.3.4, and describe mitigation plans, if any, for meeting the Payload Platform Launch Vehicle Interface Requirements Document requirements. The Offeror’s approach shall address:

a. How the payload fairing acoustic/sine vibe/shock environment for the AFSPC-44 mission is determined/predicted.
b. A description of the analysis methodology used to predict or estimate acoustic/sine vibe/shock in the fairing
c. The method and basis for the proposed approach to maintain the acoustic/sine vibe/shock within the required levels

14.4.2 Offeror shall provide verification that LVC will not violate the dynamic environment specified in the Payload Platform Launch Vehicle Interface Requirements Document (PPLVIRD) and provide historical data showing compliance during horizontal/vertical payload handling operations.

14.4.3 The Offeror shall provide technical evaluation of impacts to Dynamic Environment criteria due to secondary objectives not required by the AFSPC-44 IRD for evaluation by the Government, as proposed under Attachment 5, paragraph 7.2.2.5. If the proposed secondary
objectives do not impact this sub-factor, the Offeror shall provide historical evidence or detailed supporting rationale.

14.5 SUB-FACTOR 4: MASS-TO-ORBIT

14.5.1 Offeror shall provide a detailed description of the mass-to-orbit capability associated with the proposed launch vehicle system for the AFSPC-44 mission based on launching from the Eastern Range for the Target and Accuracy Requirements in Table 14-1. The Offeror shall provide an analysis and a description of the methodology used to generate the final mass-to-orbit for the AFSPC-44 mission and use the stated target as the requirement. At a minimum, the launch vehicle shall have the capability of injecting the Total Mass, described on Table 14-4, to the Target Requirements defined on Table 14-1. This analysis and methodology shall be based on either demonstrated flight performance or engineering data.

14.5.2 The Offeror shall fill in the vehicle specific payload equivalent mass values in Table 14-4. The Offeror shall provide the upper stage performance margin to the AFSPC-44 Target Requirements detailed in Table 14-1 with the Total Mass as defined in Table 14-4. The “Max SV Mass Used” in Table 14-4 shall be greater than or equal to SV total mass indicated in the AFSPC-44 IRD. The Offeror shall also provide the performance reserves as specified below.

a. 3-sigma Flight Performance Reserve value (defined as 99.865% probability at 50% confidence) calculated by Monte Carlo methodology with a minimum of 10,125 runs performed to the AFSPC-44 Target Requirements detailed in Table 12-1 with the Total Mass as defined in Table 12-4

b. SMC Reserve (defined as the sum of 2% of the proposed launch system performance capability to the target orbit in Table 12-1 with Orbital Debris Mitigation Standard Practice (ODMSP) compliance plus 75 pounds mass (lbm) of upper stage dry mass for instrumentation reserve, converted to upper stage propellant equivalent mass)

c. Description and quantification of any additional reserves held

d. Any additional performance margin

**Table 14-4: Mass-to-Orbit**

<table>
<thead>
<tr>
<th>Description</th>
<th>Mass</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max SV Mass Used</td>
<td></td>
<td>lbs.</td>
</tr>
<tr>
<td>Payload Adapter Mass (See Note 1)</td>
<td></td>
<td>lbs.</td>
</tr>
<tr>
<td>Total Mass</td>
<td></td>
<td>lbs.</td>
</tr>
</tbody>
</table>

Note 1: Payload Adapter (PLA) Mass is the mass of the PLA hardware including all associated harnesses, the separation system and attached hardware required for flight.

PRE-DECISIONAL
14.5.3 Offeror shall provide the planned AFSPC-44 Mission Profile including upper stage disposal approach (Orbital Debris Mitigation Standard Practices compliance is not waiverable). The mission profile shall include the Eastern range launch site and significant sequence of events to include times with respect to liftoff. At a minimum, the sequence of events shall include the following mission profile events listed below (a-k). If event is not applicable, the Offeror shall provide supporting rational.

a. First stage engine start  
b. Solid rocket motor burnout and jettison sequence (if applicable)  
c. First stage engine cutoff and separation  
d. Payload fairing jettison  
e. Upper stage engine burn ignition(s), cutoff(s) and coast time(s)  
f. Upper stage separation for Payload 1  
g. Upper stage engine re-ignition(s), cutoff(s) and coast time(s)  
h. Upper stage separation for Payload 2  
i. Initiation of upper stage CCAMs  
j. Upper stage disposal initiation  
k. End of mission for upper stage, where end of mission is defined as the completion of passivation with no further planned maneuvers, or through upper stage impact after controlled reentry

14.5.4 The Offeror shall provide methodology and results demonstrating ≥ 90% probability of success, utilizing the Monte Carlo analysis with a minimum of 10,125 runs performed, for completing the planned upper stage disposal (ODMSP compliance is not waiverable).

14.5.5 The Offeror shall provide data for any portion of the AFSPC-44 mission profile that has been flight demonstrated (T-0 to disposal burn) by the proposed or current family of launch vehicle system. Examples of data could include a table of demonstrated burn durations vs. planned burn durations; demonstrated coast durations vs. planned; re-entries achieved vs. planned; etc. The Offeror shall also identify on which flight the mission profile portion was demonstrated. The Offeror shall identify any portion of the mission profile that has not yet been flight demonstrated by proposed or current family of launch vehicle system. Undemonstrated portions of a mission profile may include, but are not specifically limited to:

a. Total proposed mission duration from launch to End of Mission is greater than 10 minutes longer than a previously flown mission  
b. Number of proposed upper stage engine relights is greater than previously flown  
c. Coast duration between upper stage engine relights is greater than 5 minutes from a previously flown mission  
d. Booster or upper stage throttle settings outside the range of have not been previously flown throttle settings  
e. Proposed CCAM or upper stage disposal solution have not been previously flown (per EELV SPRD, Rev. A)  
f. Radiation environments not previously demonstrated
14.5.6 If any of the Offeror’s previous flights do not demonstrate portions of the AFSPC-44 mission profile to include, but not limited to Paragraph 14.5.11 a–f above, then the Offeror shall provide a detailed engineering and risk analysis of the affected launch vehicle subsystems and components, and any risks or limiting factors associated with the design or configuration of the affected subsystems. The Offeror shall provide a mitigation approach that addresses the identified risks associated with the undemonstrated portion of the proposed mission profile.

14.5.7 The Offeror shall provide the ground trace and instantaneous impact point trace through end of mission or through upper stage impact if conducting a controlled reentry, with identification of nominal jettisoned body impacts. The nominal jettisoned body impacts shall occur over water. Nominal jettisoned bodies include those planned under a controlled recovery operation. If the Offeror plans to de-orbit the upper stage, they shall provide the impact ellipse. The upper stage reentry location shall be in a broad ocean area. Casualty expectation value, if applicable, and supporting analysis including mission reliability and failure scenarios shall be provided.

14.5.8 Offeror shall provide historical data, from liftoff, launch through upper stage disposal, on the final mission design trajectory predictions and flight data for mission profiles (including sequence of events and PL orbital parameters at separation) and for vehicle acceleration comparison plots for the four most recent launches (as of final RFP posted date) of a launch vehicle system similar to the proposed launch vehicle system, or as many as have been launched if fewer than four launches have taken place. Individual acceleration plots shall be provided for each burn of each stage. If the launch included a controlled reentry of the upper stage, the final mission design prediction for impact location and impact point from flight data estimated after all propulsive events shall be provided. If historical flight data does not corroborate predictions, the Offeror shall provide detailed supporting rationale to explain differences.

14.5.9 The Offeror shall provide technical evaluation of impacts to Mass-to-Orbit criteria due to secondary objectives not required by the AFSPC-44 IRD for evaluation by the Government, as proposed under Attachment 5, paragraph 7.2.2.5. If the proposed secondary objectives do not impact this sub-factor, the Offeror shall provide historical evidence or detailed supporting rationale.

14.6 VOLUME Ve AFSPC-44 FACTOR 5: PRICE

14.6.1 All dollar amounts provided shall be rounded to the nearest dollar. All labor rates shall be rounded to the nearest dollar.

14.6.2 The Offeror shall provide their proposed price for the launch service allocated to categories shown in Table 14-6. This allocation shall conform to the following WBS element to CLIN mapping, and PWS paragraph to CLIN mapping:

a. CLIN 5000, Launch Vehicle Production, consists of WBS elements 1.6, 1.8.1.1, 1.8.1.2, 1.8.1.3, 1.8.2.1, 1.8.2.2, 1.8.3, 1.8.4, 1.8.5, 1.8.6, 1.8.7, 1.9, and 1.10, and
all subsections therein; and consists of PWS paragraph 3.3, 3.5.4 and all subsections therein.

b. CLIN 5001, Mission Integration/Launch Ops /Spaceflight Worthiness Certification, consists of WBS elements 1.1.1, 1.2, 1.3, 1.5.1, 1.5.2, 1.5.3, and 1.7, and all subsections therein; and consists of PWS paragraphs 3.1, 3.2, 3.4, 3.5 (except 3.5.4), and 3.6, and all subsections therein.

c. CLIN 5002, Mission Unique: consists of PWS paragraphs 3.8.

d. CLIN 5100, Quick Reaction and Anomaly Resolution, the maximum number of 25,000 hours consists of PWS paragraph 3.7, and all subsections therein.

Table 14-6: AFSPC-44 Total Evaluated Price Calculation

<table>
<thead>
<tr>
<th>MISSION</th>
<th>CLIN</th>
<th>DESCRIPTION</th>
<th>CONTRACT TYPE</th>
<th>TOTAL PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>AFSPC-44</td>
<td>5000</td>
<td>Launch Vehicle Production Service</td>
<td>FFP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5001</td>
<td>Mission Integration / Launch Ops / Spaceflight Worthiness Certification</td>
<td>FFP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5002</td>
<td>Mission Unique</td>
<td>FFP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5100</td>
<td>Quick Reaction and Anomaly Resolution – 25,000 max hours</td>
<td>FFP</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rental Equivalency of Government Property</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Total Evaluated Price (TEP)</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix A

Work Breakdown Structure

06 November 2017
### APPENDIX A: Work Breakdown Structure

<table>
<thead>
<tr>
<th>1.0</th>
<th>Launch Vehicle System</th>
</tr>
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<tbody>
<tr>
<td>1.1</td>
<td>Mission Integration</td>
</tr>
<tr>
<td>1.1.1</td>
<td>Mission Standard Integration</td>
</tr>
<tr>
<td>1.1.2</td>
<td>Mission Unique Integration</td>
</tr>
<tr>
<td>1.2</td>
<td>Mission Assurance</td>
</tr>
<tr>
<td>1.3</td>
<td>Supplier Readiness</td>
</tr>
<tr>
<td>1.4</td>
<td>Mission Unique Development/Design</td>
</tr>
<tr>
<td>1.5</td>
<td>System Engineering, Integration, Test, Program Management</td>
</tr>
<tr>
<td>1.5.1</td>
<td>Program Management</td>
</tr>
<tr>
<td>1.5.2</td>
<td>System Engineering</td>
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<tr>
<td>1.5.3</td>
<td>Factory Support</td>
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<td>1.5.4</td>
<td>Special Studies</td>
</tr>
<tr>
<td>1.6</td>
<td>Transportation</td>
</tr>
<tr>
<td>1.7</td>
<td>Launch Operations</td>
</tr>
<tr>
<td>1.7.1</td>
<td>Launch Support</td>
</tr>
<tr>
<td>1.7.1.1</td>
<td>Launch Crew (mate, checkout, launch)</td>
</tr>
<tr>
<td>1.7.1.2</td>
<td>P/L Encapsulation</td>
</tr>
<tr>
<td>1.7.2</td>
<td>Launch Operations SEPM</td>
</tr>
<tr>
<td>1.7.2.1</td>
<td>Launch Operations Program Management</td>
</tr>
<tr>
<td>1.7.2.2</td>
<td>Launch Operations System Engineering</td>
</tr>
<tr>
<td>1.7.3</td>
<td>Site Maintenance</td>
</tr>
<tr>
<td>1.7.3.1</td>
<td>Sustainment Propellants</td>
</tr>
<tr>
<td>1.7.3.2</td>
<td>Other Maintenance</td>
</tr>
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<td>1.7.4</td>
<td>Base Support</td>
</tr>
<tr>
<td>1.7.5</td>
<td>Range Operations Services</td>
</tr>
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<td>1.7.6</td>
<td>Propellants (Vehicle)</td>
</tr>
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<td>1.8</td>
<td>Launch Vehicle</td>
</tr>
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<td>------</td>
<td>----------------</td>
</tr>
<tr>
<td>1.8.1</td>
<td>Propulsion</td>
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<td>Booster Engine</td>
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<td>Upper Stage Engine</td>
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<td>1.8.1.3</td>
<td>Solid Rocket Motors</td>
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<td>1.8.2</td>
<td>Payload Accommodations</td>
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<tr>
<td>1.8.2.1</td>
<td>Payload Fairing</td>
</tr>
<tr>
<td>1.8.2.2</td>
<td>Payload Attach Fitting (Adapter)</td>
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<tr>
<td>1.8.2.3</td>
<td>Mission Unique Hardware</td>
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<tr>
<td>1.8.3</td>
<td>Core Vehicle</td>
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<tr>
<td>1.8.3.1</td>
<td>Booster Structure</td>
</tr>
<tr>
<td>1.8.3.2</td>
<td>Intertank Adapter &amp; Skirts</td>
</tr>
<tr>
<td>1.8.3.3</td>
<td>Aft Transition Structure</td>
</tr>
<tr>
<td>1.8.3.4</td>
<td>Heat Shield</td>
</tr>
<tr>
<td>1.8.4</td>
<td>Upper Stage</td>
</tr>
<tr>
<td>1.8.4.1</td>
<td>Upper Stage Structure</td>
</tr>
<tr>
<td>1.8.4.2</td>
<td>Interstage Adapters, Stub Adapters, Forward Adapters</td>
</tr>
<tr>
<td>1.8.5</td>
<td>Mission Assurance Instrumentation</td>
</tr>
<tr>
<td>1.8.6</td>
<td>Guidance and Control (Avionics)</td>
</tr>
<tr>
<td>1.8.7</td>
<td>Integration, Assembly, Test &amp; Checkout (IAT&amp;C)</td>
</tr>
<tr>
<td>1.9</td>
<td>Training</td>
</tr>
<tr>
<td>1.10</td>
<td>Other</td>
</tr>
</tbody>
</table>
FA8811-18-R-0001
Attachment 5
Appendix B
Past Performance Information Form
06 November 2017
PAST PERFORMANCE INFORMATION FORM
Provide the information requested in this form for each contract/program (citation) being described. Provide frank, concise comments regarding your performance on the contracts you identify. Provide a separate completed form for each contract/program submitted. Limit the number of citations submitted and the length of each submission to the limitations set forth at Attachment 5, Section 4 of this solicitation.

A. Offeror Name (Company/Division): ____________________________________________
CAGE Code: _________________________________________________________________
DUNS Number: _______________________________________________________________

B. Program Title: _______________________________________________________________

C. Contract Specifics:
1. Contracting Agency or Customer: ____________________________________________
2. Contract Number: __________________________________________________________
3. Contract Type: ______________________________________________________________
4. Period of Performance: ______________________________________________________
5. Original Contract $ Value: __________________________ (Do not include unexercised options)
6. Current Contract $ Value: __________________________ (Do not include unexercised options)
If Amounts for 5 and 6 above are different, provide a brief description of the reason.
____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________
7. Launch vehicle: _____________________________________________________________
8. Orbit parameters: ____________________________________________________________

D. Brief Description of Effort as __Prime or __Subcontractor
Please indicate whether it was development and/or production, or other acquisition phase (or Service) and highlight the portions of this contract considered most relevant to current acquisition.
____________________________________________________________________________
____________________________________________________________________________
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____________________________________________________________________________

E. Completion Date:
1. Original date: ________________________________________________________________
2. Current Schedule: ___________________________________________________________
3. Estimate at Completion: _____________________________________________________
4. How Many Times Changed: _________________________________________________
5. Primary Causes of Change: _________________________________________________

F. Primary Customer Points of Contact: (For Government contracts provide current information on both individuals. For commercial contracts, provide points of contact fulfilling these same roles).

1. Program Manager and/or Site Manager:
   Name: _______________________________________________________________________
   Office: _____________________________________________________________________
   Address: ____________________________________________________________________
   Telephone: __________________________________________________________________
   FAX Number: __________________________________________________________________

2. Contracting Officer:
   Name: ______________________________________________________________________
   Office: _____________________________________________________________________
   Address: ____________________________________________________________________
   Telephone: __________________________________________________________________
   FAX Number: __________________________________________________________________

G. Address any technical (or other) area about this contract/program considered unique.
   ____________________________________________________________________________
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H. For each of the applicable sub-factors under the Performance and Schedule factors and Small Business Participation factor in Attachment 5, illustrate how your experience on this program applies to that sub-factor and factor.

I. Describe the nature or portion of the work on the proposed effort performed or to be performed by the business entity being reported here. Also, estimate the percentage of the total proposed effort performed or to be performed by this entity and whether this entity performed or will perform as the prime, subcontractor, or a corporate division related to the prime (define relationship).
FA8811-18-R-0001

Attachment 5

Appendix C

Subcontractor Consent Letter

06 November 2017
SUBCONTRACTOR/TEAMING PARTNER CONSENT LETTER
FOR THE RELEASE OF PAST PERFORMANCE INFORMATION
TO THE PRIME CONTRACTOR

Past performance information concerning subcontractors and teaming partners cannot be
disclosed to a private party without the subcontractor’s or teaming partner’s consent. Because a
prime contractor is a private party, the Government will need that consent before disclosing
subcontractor/teaming partner past and present performance information to the prime contractor
during exchanges. In an effort to assist the Government’s Past Performance evaluation team in
assessing your recent past performance relevancy and quality, we request that the following
consent letter be completed by the major subcontractors/teaming partners identified in your
proposal. The completed consent letters should be submitted as part of your Past Performance
Volume.

SAMPLE

Dear “Contracting Officer:”

We are participating as a (insert “subcontractor” or “teaming partner”) with (insert name of
prime contractor or name of entity providing proposal) in responding to the Department of the
Air Force, Space and Missile Systems Center (SMC), Request for Proposal FA8811-18-R-0001,
RFP 1A-6.

In order to facilitate the quality assessment process we are signing this consent letter to allow
you to discuss our past performance information with the prime contractor during the source
selection process.

___________________
___________________
(Signature and title of individual who has the authority to sign for and legally bind the company)

Company Name:

Address:
Attachment 5

Appendix D

Client Authorization Letter

06 November 2017
CLIENT AUTHORIZATION LETTER

Past performance information concerning private sector contractors, subcontractors and joint venture partners cannot be disclosed to the Government without their consent. Client authorization letters are required for each identified effort for each customer. This letter will authorize release to the Government of requested information on the offeror's performance. The Government will need that consent before contacting commercial customers to assess the offeror’s past performance. In an effort to assist the Government's Past Performance evaluation team in assessing your past performance relevancy and confidence, we request that the following client authorization letter be completed by any commercial customers identified in your proposal. The completed client authorization letters should be submitted as part of your Past Performance Volume.

Offerors should send with their list of references a letter similar to the following authorizing the reference to provide past performance information to the Government.

SAMPLE

Dear “Client:”

We are responding to a Department of the Air Force, Space and Missile Systems Center (SMC), Request for Proposal FA8811-18-R-0001, RFP 1A-6.

The Government requires those clients of entities responding to their solicitation to be identified, and their participation in the evaluation process is requested. In the event that you are contacted for information on work performed, you are hereby authorized to respond to those inquiries.

We have identified Mr./Ms.____________________________ of your organization as the point of contact based on his/her knowledge of our work. Your cooperation is appreciated. Any questions may be directed to ____________________________.

Sincerely,
FA8811-18-R-0001
Attachment 5

Appendix E

Past Performance Questionnaire

06 November 2017
PAST PERFORMANCE QUESTIONNAIRE (PPQ)

WHEN FILLED IN THIS DOCUMENT IS SOURCE SELECTION SENSITIVE INFORMATION IAW FAR 2.101 & 3.104

SECTION 1: CONTRACT IDENTIFICATION

A. Contractor: _____________________________________________

B. Contractor Cage Code: _________________________________

C. Contract number: ______________________________________

D. Contract type: _________________________________________

E. Was this a competitive contract? Yes _____ No _____

F. Period of performance: _________________________________

G. Initial contract cost: $_______________________________

H. Current/final contract cost: $____________________________

I. Reasons for differences between initial contract cost and final contract costs:
   ___________________________________________________________________
   ___________________________________________________________________
   ___________________________________________________________________
   ___________________________________________________________________
   ___________________________________________________________________

J. Description of service provided:
   ___________________________________________________________________
   ___________________________________________________________________
   ___________________________________________________________________
   ___________________________________________________________________
   ___________________________________________________________________

K. Orbit parameters: _______________________________________

L. Launch vehicle: _________________________________________

SECTION 2: CUSTOMER OR AGENCY IDENTIFICATION

A. Customer or agency name: _________________________________

B. Procuring Contracting Officer (or equivalent) name, e-mail, and phone number:
   __________________________________________________________
   __________________________________________________________
   __________________________________________________________
C. Customer or agency description (if applicable): __________________________________________
________________________________________________________________________________

SECTION 3: EVALUATOR IDENTIFICATION

A. Evaluator's name: ________________________________________________________________

B. Evaluator's title: _________________________________________________________________

C. Evaluator’s email address: __________________________________________________________

D. Evaluator's phone/fax number: ______________________________________________________

Length of time (number of years/months) evaluator worked on subject contract: _________________

SECTION 4: EVALUATION

Please indicate your satisfaction with the contractor’s performance by placing an “X” in the appropriate block using the scale provided to the right of each question. This scale is defined as follows:

PERFORMANCE RATING

ACCEPTABLE - During the entire period, the contractor met the requirements of the contract and consistently performed at an acceptable level. Performance was accomplished with some problems, and the contractor took effective corrective action for those problems that did occur. If rated acceptable, add comments to justify the rating.

UNACCEPTABLE – During the entire period, the contractor did not meet some or any of the requirements of the contract and performance was at an unacceptable level. There were a number of serious problems that required extensive oversight and involvement, and corrective actions were either ineffective or non-existent. If rated unacceptable, add comments to justify the rating.

N/A NOT APPLICABLE - Unable to provide a rating. Contract did not include performance for this aspect, or information was not available. Do not know. Add comments as appropriate.

<table>
<thead>
<tr>
<th>Performance</th>
<th>A</th>
<th>U</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1. How well did the contractor meet the technical requirements of the specification?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P2.</td>
<td>How was the quality/integrity of technical data or report preparation efforts?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----</td>
<td>--------------------------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comment:</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>P3.</th>
<th>How did the contractor conduct requirements management and flow-down?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comment:</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>P4.</th>
<th>How well did the contractor conduct/support the customer’s required technical reviews, Mission Assurance or Independent Readiness Review Teams?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comment:</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>P5.</th>
<th>How well did the contractor implement quality processes, standard practices for computer hardware and software design, operation, maintenance, upgrades and configuration control?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comment:</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>P6.</th>
<th>How effective were the contractor’s methodologies used for software/hardware qualification and flight testing?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comment:</td>
<td></td>
</tr>
</tbody>
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<th>P7.</th>
<th>How effective were the contractor’s hardware procurement and fabrication control processes in proactively assuring that installed parts meet design criteria?</th>
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<td>P8. How successfully did the contractor execute orbital payload insertion mission(s)?</td>
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<td>P9. How complete and structured was the contractor’s design in terms of meeting technical requirements and presenting rigorous analysis of designs and design alternatives?</td>
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<td>P10. How cooperative and responsive was the contractor when dealing with other Mission Partners (i.e., Range, Space Vehicle Contractor, Encapsulation Facility Contractor, etc.)?</td>
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<td>P11. How effectively did the contractor manage integration of the primary payload and secondary payload (e.g. EELV Secondary Payload Adapter [ESPA] or similar rideshare capability) into an integrated payload stack?</td>
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<td>P12. How successfully did the contractor accommodate changes to the secondary payload configuration (e.g. ESPA and APL configuration) during the integration cycle?</td>
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<td><strong>P13.</strong></td>
<td>How effectivelyuccessfully did the contractor manage and execute integration of classified payloads?</td>
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<td><strong>P14.</strong></td>
<td>How complete and adequate was the contractor's support of payload processing for multiple payloads?</td>
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<tr>
<td><strong>Schedule</strong></td>
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<td><strong>S1.</strong></td>
<td>How accurately did the contractor forecast the schedule?</td>
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<td><strong>S2.</strong></td>
<td>How well did the contractor perform against the contract and/or delivery schedule?</td>
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<td><strong>S3.</strong></td>
<td>How successfully did the contractor alert the customer of unforeseen schedule changes (accelerations and/or delays) before they occurred?</td>
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<td><strong>S4.</strong></td>
<td>How successfully did the contractor respond to emergency and/or surge situations?</td>
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2. Please provide any specific strengths that provided value to the customer in the contractor’s execution in their responsibilities.

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3. Please discuss each and every response for which you indicated as Unacceptable (U) in response to the questions above (use additional sheets, if necessary).

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A  U  N/A
S5. How effectively did the contractor manage scheduling and communicate issues that may affect other stakeholders and/or project completion?
Comment:__________________________________________________
___________________________________________________________
__________________________________________________________
4. Was this contract partially or completely terminated for default or convenience or are there any pending terminations?

   Yes___  Default___  Convenience___  Pending Terminations___  No ___

If yes, please explain (e.g., inability to meet cost, performance, or delivery schedules).

______________________________
______________________________
______________________________

SECTION 5: NARRATIVE SUMMARY

Would you have any reservations about soliciting this contractor in the future or having them perform one of your critical and demanding programs?

______________________________
______________________________
______________________________

Please provide any additional comments concerning this contractor’s performance, as desired.

______________________________
______________________________
______________________________

______________________________
Evaluator’s Signature  

Date

Please return this completed questionnaire to:

Los Angeles Air Force Base
Attn: SMC/LE, Capt Ashley Cunningham
483 N. Aviation Blvd
El Segundo, CA 90245
E-Mail to: ashley.cunningham.4@us.af.mil