Source Selection Statement
for the
ISS Commercial Resupply Services 2 (CRS2) Contract
National Aeronautics and Space Administration
(Solicitation Number NNJ14507542R)

On December 18, 2015, the Source Evaluation Board (SEB) appointed to evaluate proposals for the International Space Station (ISS) Commercial Resupply Services 2 (CRS2) contract under Solicitation Number NNJ14507542R presented its final evaluation to me and other senior officials of the National Aeronautics and Space Administration (NASA) and the Federal Aviation Administration (FAA).

Procurement Requirements

The purpose of the ISS Commercial Resupply Services 2 (CRS2) contract is to obtain cargo resupply services to the ISS, dispose of unneeded cargo, and return cargo from the ISS back to NASA. The end-to-end service includes all activities and resources to provide the resupply services, including: building, integrating and operating the launch vehicle, ISS visiting cargo vehicle, and re-entry vehicle; launch and landing operations and infrastructure; cargo processing and integration; ground and flight operations; mission planning and management; and ISS integration certification to ensure the vehicles and operations meet ISS requirements. Cargo includes both pressurized and unpressurized cargo. NASA requires the service to provide the annual required cargo delivery ("upmass") to the ISS in no fewer than four flights per year with the cargo somewhat evenly distributed throughout the year. Each flight must provide a minimum pressurized cargo mass of 2500 kg, and up to a maximum of 5000kg.

CRS2 is a commercial service, firm fixed price, Indefinite Delivery\Indefinite Quantity (IDIQ) contract. The Request for Proposal (RFP) contemplates one or more awards. The total maximum value of any contract is $14 billion. The total amount of all task orders under all contracts collectively shall not exceed $14 billion. The guaranteed minimum value for any contract is six cargo resupply missions. The period of performance begins upon contract award, and provides for ISS integration to begin in late 2016 and missions to be flown starting in 2019 and continuing through the end of 2024. The contract is organized into two contract line item numbers (CLINs).

CLIN 0001 describes the standard resupply service missions available under each offeror's contract. All contractors are required to provide 1) pressurized upmass, 2) pressurized return or pressurized disposal or both, and 3) unpressurized upmass and disposal. Each offeror may propose up to four different missions that collectively provide these services; for example, by providing all of these services in one mission or by distributing the types of services among separate missions. These are the "standard" missions that would be available under the contract for that offeror, listed in the contract as CLINs 0001A-D. Contractors have the option to provide accelerated pressurized return as part of any of their standard missions. Contractors can provide the required and optional capabilities by combining them in any manner they choose within their unique missions. The RFP establishes various minimum and maximum requirements for volume

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and mass capacities for the vehicles and cargo, frequency of launches and landings, duration for the vehicle to remain on the ISS, cargo turnover, and reviews and data deliverables at various stages of the missions. CLIN 0001E is for flight support equipment.

CLIN 0002 includes initial ISS integration certification for each standard mission type (CLIN 0002A); assessment of NASA requirements changes (CLIN 0002B); and special task assignments and studies (CLIN 0002C).

Evaluation Process and Criteria

The procurement was conducted as a full and open competition in accordance with Federal Acquisition Regulation (FAR) Part 12, Acquisition of Commercial Items in conjunction with the policies and procedures for solicitation, evaluation, and selection in FAR Part 15, Contracting by Negotiation.

The RFP included three evaluation factors: Mission Suitability, Past Performance, and Price. Price is approximately equal to the combination of Mission Suitability and Past Performance. Mission Suitability is more important than Past Performance. Price is more important than Mission Suitability. Price is more important than Past Performance.

Mission Suitability was weighted and scored on a 1,000 point scale, including three subfactors:

Mission Suitability Sub-Factors	Points
Technical Approach T1: System Capabilities and Performance • Capabilities • Operational Level of Maturity • Annual Production/Delivery Capability • Key Resources T2: Initial ISS Integration Certification T3: ISS Resupply Mission Performance Plan T4: Risks and External Dependencies	650
Management Approach M1: Company Information • Management Team • Teaming Arrangements • Management Processes M2: Performance Milestones M3: Safety and Mission Assurance	300
Small Business Utilization • Small Business Subcontracting • Commitment to Small Businesses	50
TOTAL	**1000**

For each Mission Suitability subfactor, the SEB identified "findings" of significant strengths, strengths, weaknesses, significant weaknesses, or deficiencies. The SEB then determined an

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adjectival rating and percentile score for each subfactor using the definitions and percentile ranges in Part 1815.305(a)(3)(A) of the NASA FAR Supplement (NFS). The adjectival ratings for each of the three Mission Suitability subfactors were Excellent, Very Good, Good, Fair, and Poor. The overall Mission Suitability factor received a total numerical score using the weighted sum of the subfactor scores but did not receive an overall adjectival rating.

Past Performance: Since Past Performance can be an indicator of performance under the proposed contract, the past performance of each offeror (including past performance of major team members, subcontractors, and suppliers) was evaluated. The SEB assessed each offeror's recent, relevant work that is similar in magnitude, content, and complexity to the requirements of the CRS2 contract. More relevant contracts and agreements were given more consideration in assessing overall past performance. The SEB evaluated performance on contracts and agreements that were current or completed within the prior four years. The evaluation considered prior technical performance, project management, safety, mission success, number and severity of problems, and effectiveness of corrective actions. The SEB considered information provided by the offerors and their references, information from Government sources, and information obtained during discussions when applicable. The evaluation of Past Performance was conducted in accordance with FAR Part 15.305(a)(2) "Proposal Evaluation" and the RFP. Each proposal was assigned an overall level of confidence rating using the definitions in NFS Part 1815.305(a)(2)(A): Very High, High, Moderate, Low, Very Low, or Neutral.

Price: Price analysis was performed in accordance with FAR Part 15.404-1 to validate price reasonableness on all proposed CLIN 0001 and 0002 prices. For evaluation purposes, the SEB considered the price for each standard mission (CLIN 0001A-D), totaled for all contract years 2018 through 2024, plus the ISS integration price (CLIN 0002A). The evaluated price for each standard mission type and associated integration price was determined according to the following formula:

> (CLIN 0002A ISS Integration Certification Base and Delta Price) + the sum of (CLIN 0001 Contract Years 2018-2024 NTE Standard Mission prices at ½ annual demand for pressurized upmass).

The RFP stated the annual total need for evaluation purposes is 15,000 kg for pressurized upmass and 2000 kg for only unpressurized upmass. For each proposed standard mission, the evaluation looked at the price for providing half of this annual total upmass (7500kg pressurized, 1000 kg unpressurized) every year for 2018 through 2024 combined. The number of flights each offeror needs each year to provide half of the annual upmass depends on the capacity and configuration of its unique vehicle. If an offeror proposed a 100% unpressurized upmass mission, 50% of the annual unpressurized upmass need in kilograms per contract year was used instead of 50% of the pressurized upmass need.

For evaluation purposes, each mission price (CLIN 0001) was adjusted by adding $14 million if the offeror proposed to use a Government furnished NASA Docking System (NDS); adding the time value of financed milestone payments; and adding adjustments for any proposed Government furnished equipment or services that provide a competitive advantage in accordance

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with FAR Part 45.202. The integration price (CLIN 0002A) also was adjusted for the time value of financed milestone payments and any proposed Government furnished equipment or services that provide a competitive advantage.

Evaluation of Initial Proposals and Competitive Range

The RFP was released on September 25, 2014. Amendment 1 was posted on October 15, 2014 to answer questions and provide revisions to the RFP as well as provide a Task Plan Point of Contact list. Amendment 2 was posted on October 28, 2014 to answer questions and provide revisions to the RFP as well as extend the proposal due date to December 2, 2014. Amendment 3 was posted on November 6, 2014 to answer questions and provide revisions to the RFP. Amendment 4 was posted on November 17, 2014 to answer questions and provide revisions to the RFP as well as notify offerors that NASA Docking System (NDS) data identified in Clause II.A.25 of the RFP was added to the Technical Library.

Timely proposals were received by the December 2, 2014 due date from the following companies:

- The Boeing Company (Boeing)
- Lockheed Martin Corporation (Lockheed Martin)
- Orbital Sciences Corporation (Orbital)
- Sierra Nevada Corporation (Sierra Nevada)
- Space Exploration Technologies Corporation (SpaceX)

The results of the initial evaluation were presented to me and my senior advisors on April 3, 2015. The presentation included a detailed evaluation of each proposal including Mission Suitability, Past Performance, and Price, as well as areas where additional information or clarification was needed. Based on this evaluation, I determined that award on initial proposals was not appropriate.

I concurred with the Contracting Officer's determination that four of the five proposals, from Boeing, Orbital, Sierra Nevada, and SpaceX, should be in the competitive range.

The four remaining offerors were informed of their inclusion in the competitive range on May 6, 2015. These letters included Amendment 5 to the RFP to modify several technical requirements in the Statement of Work. This Amendment resulted from my direction to the SEB to review, update, and clarify the SOW and RFP instructions. Amendment 6 to the RFP was sent to all offerors in the competitive range on June 17th to further update the RFP. The offerors also were informed that initial missions under the CRS2 contract were less likely to occur in 2018 and might occur as late as 2019, and were provided time to revise their proposals accordingly. Discussions were held with these four offerors over a period of several weeks and concluded with receipt of proposal revisions on July 16, 2015. As part of discussions, each offeror was provided an opportunity to address any deficiencies, significant weaknesses, weaknesses, and aspects of the proposal requiring further clarification, in writing, orally, and through proposal change pages.

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The SEB presented its evaluation of the revised proposals to me and my advisors on September 30, 2015. However, I determined that it was necessary to continue discussions. Due to ISS Program constraints and evolving schedule, CRS2 missions now are not expected to occur until October 2019. Task orders for sub-CLIN 0002A, Initial ISS Integration Certification are not anticipated until late in calendar year 2016. The Government may issue task orders for sub-CLIN 0002B, NASA Requirement Change Evaluation, and sub-CLIN 0002C, Special Tasks and Studies that begin shortly after contract award. In order to maximize the potential for obtaining the best value for the Government, and to ensure proposals and model contracts align with the revised schedule, additional discussions were necessary to allow offerors to address this new information and provide any resulting proposal adjustments.

Based on the proposals and evaluation, and in accordance with FAR Part 15.306, the competitive range was narrowed to include only the most highly rated proposals in the continued discussions and to exclude proposals that were no longer among the most highly rated. I concurred with the Contracting Officer's determination that the proposals from Orbital, Sierra Nevada, and SpaceX should remain in the competitive range.

On November 5th, discussions were re-opened with the offerors that remained in the competitive range. These three offerors were notified of the revised contract schedule, and were given the opportunity to update their CLIN pricing, model contracts, and any other aspects of their proposals based on the revised schedule. During oral and written discussions the offerors confirmed that they understood the revised schedule and adjusted their proposals accordingly. FAR Part 15.306 also requires informing offerors of any deficiencies, significant weaknesses, or adverse past performance to which the offeror has not had the opportunity to respond; however, there was no such information from the prior proposals to provide and there were no proposed exceptions or deviations to contract requirements. Proposal updates were received from all three offerors by the due date of December 8, 2015, and resulted in updates to the pricing and milestones for the revised mission years but no changes to the Mission Suitability or Past Performance evaluation.

Evaluation of Final Proposals

Orbital

Under the Mission Suitability factor, the SEB gave Orbital's proposal an overall score of 880 points out of 1000 points.

Under the Technical Approach subfactor, Orbital received an adjectival rating of "Very Good" with 3 significant strengths, 8 strengths, no significant weaknesses, and 2 weaknesses. The three significant strengths are: (1) a comprehensive set of capabilities at the maximum requested SOW pressurized and unpressurized cargo upmass and disposal requirements; (2) the use of heritage systems, previously developed concepts of operations and joint NASA/Orbital operational processes, and CRS1 certifications; (3) leveraging existing CRS1 ISS certification and clear plans for CRS2 implementation. The eight strengths are: (1) the ability to accommodate variability in ISS cargo bag types and manifest changes with its pressurized cargo module; (2) effective solutions to enable flexibility for ISS vehicle traffic planning; (3) use of an

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Atlas V launch vehicle and ground infrastructure with extensive flight history and credible heritage for one of the three missions; (4) a launch on need capability as part of its standard service; (5) mitigation of external dependency risks on foreign engines; (6) use of two disparate launch options both with credible ground infrastructure and launch history; (7) capability to command payloads; and (8) a clear, credible, effective Mission Integration and Operations Management Plan.

The two weaknesses are: (1) positioning of the Power, Video, Grapple Fixture (PVGF); and (2) a lack of effective mitigation strategy for the risk of launch site availability and failure to identify key risks to late load and launch scrub enhancements.

Under the Management Approach subfactor, Orbital received an adjectival rating of "Excellent" with 3 significant strengths, no strengths, no significant weaknesses, and 1 weakness. The three significant strengths are: (1) a proven management team with extensive ISS cargo resupply and fixed price contract experience; (2) teaming arrangements with partners with extensive experience supporting ISS cargo resupply; and (3) use of a modified version of a flight-proven/operational Cygnus spacecraft design that has previously been through the ISS Safety Review Panel process and successfully demonstrated safe ISS operations. The one weakness is: (1) not providing NASA electronic access to audit data and conflicting mishap reporting.

Under the Small Business Utilization subfactor, Orbital received an adjectival rating of "Good" with no significant strengths, 1 strength, no significant weaknesses, and no weaknesses. The one strength is: (1) identifying work that can be completed by small businesses and continuing relationships with small businesses that currently have contracts in place.

Under the Price factor, Orbital's proposed mission prices were evaluated for price reasonableness and were determined to be reasonable based on comparison to other competitive and historical prices.

Under the Past Performance factor, Orbital received a High level of confidence rating, meaning the SEB had a high level of confidence that Orbital will successfully perform the CRS2 work based on its past performance. Orbital and its major subcontractors form an accomplished team for very highly pertinent aspects of the CRS2 requirements such as development of launch/space vehicles, launch services, ISS integration, cargo processing and integration, and mission operations. The relevant past performance of Orbital and its team is very highly pertinent to CRS2, demonstrating effective technical, management, and safety performance that would be fully responsive to CRS2 requirements. There were noted technical, schedule, and launch failure issues, as well as responsive actions.

Sierra Nevada

Under the Mission Suitability factor, the SEB gave Sierra Nevada's proposal an overall score of 879 points out of 1000 points.

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Under the Technical Approach subfactor, Sierra Nevada received an adjectival rating of "Excellent" with 4 significant strengths, 9 strengths, no significant weaknesses, and no weaknesses. The four significant strengths are: (1) a comprehensive set of capabilities to support research and fully enable utilization of the ISS as a research facility; (2) using a single vehicle that has a comprehensive set of capabilities at the upper range of requested RFP pressurized and unpressurized cargo upmass, return, and disposal requirements; (3) a highly effective solution to provide significant flexibility to ISS launch vehicle traffic planning; and (4) using an Atlas V launch vehicle and ground infrastructure with extensive flight history and credible heritage. The nine strengths are: (1) ability to accommodate the variability of ISS cargo bag types and effective understanding of changes required during the ISS manifesting process; (2) approach to returning cargo to NASA post mission; (3) capability to command payloads; (4) a launch on need capability as part of its standard service; (5) a clear, credible, and effective Mission Integration and Operations Management Plan; (6) mitigation of external dependency risks on foreign engines and contingency planning for alternate launch vehicles and launch sites; (7) preliminary orbital debris analysis; (8) capability of berthing Mission B to resupply and return large science items and systems components; and (9) using updated certification products from Commercial Crew contracts and advancing DCCS spacecraft design and products to reduce schedule and technical risk.

Under the Management Approach subfactor, Sierra Nevada received an adjectival rating of "Very Good" with 1 significant strength, 6 strengths, no significant weaknesses, and 1 weakness. The significant strength is: (1) its experienced subcontractor team and subcontract management approach that provides clear oversight. The six strengths are: (1) its comprehensive integrated management processes; (2) the structure of its milestone payments; (3) its experienced management team; (4) early identification of ISS crew and vehicle hazards, causes, controls, and preliminary verification approaches; (5) an effective risk management program; and (6) an effective and comprehensive Mishap Preparedness and Contingency Plan.

The one weakness is: (1) the lengthy lead time for Authority to Proceed on missions.

Under the Small Business Utilization subfactor, Sierra Nevada received an adjectival rating of "Good" with no significant strengths, 2 strengths, no significant weaknesses, and no weaknesses. The strengths are: (1) a high small business subcontracting goal; and (2) early efforts in identifying small businesses to perform high technology subcontract work and participation in the Mentor-Protégé program.

Under the Price factor, Sierra Nevada's proposed mission prices were evaluated for price reasonableness and were determined to be reasonable based on comparison to other competitive and historical prices.

Under the Past Performance factor, Sierra Nevada received a High level of confidence rating, meaning the SEB had a high level of confidence that Sierra Nevada will successfully perform the CRS2 work based on its past performance. Sierra Nevada and its major subcontractors form an accomplished team with a compilation of recent contracts that are relevant to the CRS2 scope of work for System Capabilities, Initial ISS Integration Certification, and Mission Performance. The relevant past performance of Sierra Nevada and its team is highly pertinent to CRS2, with

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the exception of experience managing a project the scale of the CRS2 contract, demonstrating very effective technical, management, and safety performance that would be fully responsive to CRS2 requirements. Some problem areas and resolutions were noted.

SpaceX

Under the Mission Suitability factor, the SEB gave SpaceX's proposal an overall score of 922 points out of 1000 points.

Under the Technical Approach subfactor, SpaceX received an adjectival rating of "Excellent" with 4 significant strengths, 12 strengths, no significant weaknesses, and no weaknesses. The significant strengths are: (1) the use of heritage spacecraft systems, previously developed concepts of operations and joint operational processes, and CRS1 certifications; (2) a comprehensive set of capabilities to support research and enable utilization of the ISS as a research facility; (3) a design, development, production, and testing approach which greatly reduces dependency on external entities; and (4) leveraging existing development and certification under CRS1 and Commercial Crew contracts for ISS integration. The twelve strengths are: (1) ability to accommodate the variability of ISS cargo bag types and manifest changes; (2) an effective capability to resupply and return large science/systems components; (3) an effective solution to provide flexibility to ISS launch vehicle traffic planning; (4) capability to command payloads; (5) use of a Falcon 9 launch vehicle and ground infrastructure with flight history and credible heritage; (6) back-up launch pad to mitigate risks and avoid delays at its primary launch complex; (7) inclusion of shared CRS2 objectives during a flight under another contract to increase the level of maturity and prove systems before CRS2 missions; (8) an optional launch on need capability; (9) approach to returning cargo to NASA post mission; (10) effective training approach including its vehicle mock-up; (11) launch abort capability, and (12) a clear, credible, and effective Mission Integration and Operations Management Plan.

Under the Management Approach subfactor, SpaceX received an adjectival rating of "Excellent" with 2 significant strengths, 1 strength, no significant weaknesses, and 1 weakness. The significant strengths are: (1) a management team with significant experience and a proven management approach for providing cargo resupply under a firm fixed price contract; (2) demonstrated ISS flight safety operations and leveraging the Phase I Safety Review under CPC. SpaceX received a strength for its effective Safety and Health plan. The one weakness is: (1) a lack of information on how it flows GIDEP and Alerts to its suppliers.

Under the Small Business Utilization subfactor, SpaceX received an adjectival rating of "Good" with no significant strengths, 1 strength, no significant weaknesses, and no weaknesses. The strength is: (1) its approach to work with small business to align capabilities and capacity to long term goals.

Under the Price factor, SpaceX's proposed mission prices were evaluated for price reasonableness and were determined to be reasonable based on comparison to other competitive and historical prices.

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Under the Past Performance factor, SpaceX received a High level of confidence rating, meaning the SEB had a high level of confidence that SpaceX will successfully perform the CRS2 work based on its past performance. SpaceX is an accomplished company with a compilation of recent contracts that are relevant to the CRS2 scope of work for System Capabilities, Initial ISS Integration Certification, and Mission Performance. The relevant past performance of SpaceX is very highly pertinent to CRS2, demonstrating very effective technical, management, and safety performance that would be fully responsive to CRS2 requirements. There were noted schedule, technical, management, and launch failure issues, along with responsive actions.

Source Selection Assessment

During each evaluation presentation I questioned the SEB on their evaluation and carefully considered the material presented. I requested and considered the comments of the senior officials who also attended the briefing. The final charts summarized the SEB's results for all three evaluation factors. They also included a summary description of each offeror's proposed vehicles, standard mission capabilities, and basic mission information, management structure organizational chart, and summary of teaming arrangements. The SEB did a careful, thorough job evaluating the proposals, documenting their evaluation, and identifying and explaining the reasons for their findings of the strengths and weaknesses in each proposal. They explained how initial findings had changed based on the revised proposals, including whether and how weaknesses had been resolved and any new findings resulting from the revised proposals, and also explained how offerors adjusted their final proposals to align with the revised mission schedule. The SEB provided answers to follow-up questions I asked. I also read the SEB's more detailed reports describing the Mission Suitability findings, past performance, and pricing analysis for each proposal.

As the SSA, it was my responsibility to compare the proposals looking at the SEB's evaluation of each factor and subfactor, and considering the proposals in their entirety. It also was my responsibility to make an independent judgment of the SEB's final evaluation results and to determine which aspects of the evaluation I agreed with and which aspects I considered to be discriminators that inform my selection decision. I agreed in general with the SEB's findings, but did not always place the same significance on those findings or agree with the impact the finding was likely to have on the offeror's performance of the contract.

My assessment of each final proposal is as follows:

Orbital

Mission Suitability: I noted that Orbital's final proposal had the second highest overall Mission Suitability score, and was rated Very Good in the most important of the three Mission Suitability subfactors (Technical Approach). The proposal was rated Excellent in the Management subfactor and Good in the Small Business subfactor. I agree with this assessment.

Orbital's proposal offers three standard missions. Two missions provide pressurized cargo delivery and disposal, and one provides unpressurized cargo delivery and disposal. The

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pressurized cargo missions offer two different launch vehicles. All missions berth to ISS. This covers the range of required mission services, in separate missions. It does not provide cargo return, although it meets the requirement to provide either return or disposal of pressurized cargo.

Technical Approach: Orbital's proposal has several significant strengths, notably the comprehensive mission capabilities. The pressurized cargo capacity of its vehicles exceeds the required minimum capacity considerably and is in the mid-to-upper range of what the RFP allows, and the unpressurized capacity is at the upper range. Several other features of its vehicles also exceed or are at the upper range of requirements, such as cargo bag capacity, late load, middeck powered locker quantity, pressurized power, and launch scrub turnaround time, which further increases NASA's manifest flexibility. Other strengths in this proposal also contribute to manifest and cargo operations flexibility, such as payload commanding and accommodating variability in cargo bag types. Orbital also has a significant strength for leveraging heritage spacecraft hardware and existing concepts of operations and interface certifications, which reduces schedule risk and increases reliability. Leveraging existing ISS integration certification and demonstrating a clear plan for implementing updates to the system also is a significant strength that reduces ISS integration schedule and technical risk. Orbital also has a good Mission Integration and Operations Management Plan. I noted other technical strengths in this proposal, such as the launch on need capability and use of multiple launch locations, which both increase launch flexibility, and use of heritage launch vehicle and ground infrastructure for one of its missions, which minimizes launch risk. I asked about the future availability of planned propulsion for the launch vehicles, specifically Russian engines, and was satisfied with the explanation of how Orbital is mitigating this external risk.

I also considered and asked about the two technical weaknesses in this proposal. One weakness was the positioning of the Power, Video, Grapple Fixture (PVGF) on the vehicle, which may have some operational impact to the ISS. The other weakness is insufficient identification and mitigation of risks associated with implementing late load and launch scrub turnaround. These are important aspects of performance, and therefore clear understanding and mitigation of risks is important to ensure they can be successfully implemented.

Management Approach: Orbital's proposal was strong in Management and had several significant strengths, including both a management team and partner team members experienced in ISS resupply operations and in working with both pressurized and unpressurized cargo. This experience and established roles and responsibilities will enhance overall management of the contract. Use of a spacecraft that has been through the ISS safety review process also is a significant safety and mission assurance feature of the proposal because it allows early hazard assessment. I also noted the one weakness related to electronic access to data and mishap reports but did not consider it a significant problem. The data will be available to NASA at the offeror's facility, but not electronically.

Small Business Utilization: I also considered the one strength for commitment to using small businesses, but did not find it to be a discriminator.

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Past Performance: I questioned the SEB to understand their overall rating of Orbital's past performance as a High level of confidence. I agreed that Orbital and its major partners have performed work on other contracts and agreements that is very relevant to the type, size, and complexity of the CRS2 requirements. I considered that Orbital's work on the current CRS1 contract for ISS resupply services, and the COTS funded agreement that developed the vehicles and demonstrated flights to the ISS, are the most relevant of the various projects it has done although I also considered Orbital's other launch contracts. Orbital has actually performed ISS cargo processing and integration, vehicle development, and ISS integration and operations in a fixed price environment, as well as performing launch services. For the most part this work was of good quality and milestones and overall objectives were completed.

However, there were delays on CRS1 and COTS that I considered more significant than the SEB did, and Orbital had problems with main engines, software, and significantly underestimated the work necessary for establishing its launch infrastructure at the Wallops Flight Facility. Orbital had a catastrophic launch failure on the CRS1 contract within the last year and fairing separation failures that resulted in mission losses on the SELVS contract, which I consider significant, although they have been responsive to try to identify and resolve the problems and mitigate future risk. Orbital has managed the Wallops repairs well and provided an acceptable plan for continuing to perform the rest of the CRS1 contract. Finding another launch vehicle and location and reestablishing services under CRS1, including a successful launch on its latest CRS1 mission, was an effective mitigation to the failure. I also considered that past performance is about the offeror's overall performance; while these launch failures were significant, they are not the only or defining aspect of Orbital's performance.

The major subcontractor (ULA) for one of Orbital's two launch vehicles has extensive experience on the NASA Launch Services contract, which requires preparation, integration and launch service for high-value payloads and thus is very relevant to launching the CRS2 missions. They have demonstrated good project management. Orbital's other major subcontractors all have very relevant experience in the areas of work they are proposed to perform on the CRS2 contract and were rated by their customers between Good and Excellent on their performance.

Price: The evaluated prices for all of Orbital's missions, inclusive of integration and adjustments, were lower than the evaluated prices of both of the other offerors. Their two pressurized mission prices were notably lower than the second lowest mission prices (Sierra Nevada's) and significantly lower than the highest prices (SpaceX's). Orbital's pressurized missions both provide disposal, which is an important capability but is less technically complex and therefore less expensive than pressurized return. Orbital had the only proposal with a separate unpressurized mission; this price was reasonable and lower than all of the other offerors' mission prices. I also noted that Orbital had the lowest integration prices. I agreed that the prices for the other CLINs (which were not evaluated but were assessed for reasonableness) were reasonable.

Sierra Nevada

Mission Suitability: I noted that Sierra Nevada's final proposal had the third highest overall Mission Suitability score, almost exactly the same as the second highest score, and was rated

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Excellent in the most important of the three Mission Suitability subfactors (Technical Approach). The proposal was rated Very Good in the Management subfactor and Good in the Small Business subfactor. I agree with this assessment.

Sierra Nevada's proposal offers two standard missions, which both provide pressurized cargo delivery, return, and disposal, as well as unpressurized cargo delivery and disposal. One mission type has the ability to dock and the other to berth to ISS. This approach provides missions that each include the complete range of required mission services (pressurized and unpressurized cargo) within one mission.

Technical Approach: The proposal has several significant technical strengths. The comprehensive set of mission capabilities, including cargo late load, significant accelerated cargo return, rapid rendezvous with the ISS and rapid launch scrub turnaround, launching and landing at the same location and several other features all contribute to meeting the ISS operational needs as a research facility, which can require flexibility and timely transportation of experiments and materials. Providing a single vehicle that can perform all required mission services in any given flight, and accommodates the upper range of many of the cargo capacity requirements, significantly increases NASA's manifest and ISS vehicle traffic flexibility. Various other features also create flexibility, such as the frequency of launch and landing opportunities, port relocation ability, loitering at the ISS and duration of remaining mated with the ISS, which is important for safely managing the flow of vehicle traffic to and from the ISS. I also noted the significant strength for the credible heritage of the Atlas launch vehicle and infrastructure, which minimizes risk for the launch, although it is a new variant of the Atlas. Other strengths in this proposal also contribute to manifest and cargo operations flexibility, such as the launch on need capability, payload commanding, return cargo turnover time, and accommodating variability in cargo bag types and both delivery and return of large cargo bags. Sierra Nevada also has a good Mission Integration and Operations Management Plan. I asked about the future availability of planned propulsion for the launch vehicles, specifically Russian engines, and was satisfied with the explanation of how Sierra Nevada is mitigating this external risk. Sierra Nevada also is building on and updating ISS certification work done under other efforts, which expedites ISS integration for CRS2 and reduces schedule risk. I asked about several aspects of the vehicle structure and configuration, power requirements, and approach for docking with the ISS to be sure I understood the vehicle's capability and operations. The final evaluation indicated all initial weaknesses had been resolved. However, I questioned several aspects of the system design and maturity, and whether the proposed lead time for the first mission was aligned with the amount of development work remaining and the plan for that development, as well as the work still remaining for ISS integration.

Management Approach: Sierra Nevada's proposal has a significant strength for its team of experienced subcontractors and its subcontract management approach, and strengths for its experienced management team and integrated management processes, which collectively will increase overall oversight and coordination of the work. I noted the strengths for various safety and mission assurance planning and risk management which will contribute to safe operations. I also appreciated the strength for Sierra Nevada's milestone payments, which reduce NASA's financial risk by tying payments to a higher level of mission completion. However, this was offset by the weakness for the lead time needed to ATP a mission, which necessitates authorizing

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work on several missions prior to completion of certain ISS integration milestones. My concern was not based on the number of months of ATP lead time, but on the amount of technical development work to be done for the first mission within that time frame.

Small Business Utilization: I also considered the two strengths for small business goals and commitment, but did not find them to be discriminators.

Past Performance: I agreed with the SEB's assessment of a High level of confidence in Sierra Nevada's overall past performance. I noted that Sierra Nevada has performed contracts and agreements that cover aspects of the CRS2 scope of work, such as ISS and vehicle integration, and vehicle and systems development, although they have limited experience in management of a project of this scale. However, Sierra Nevada has shown good project management, and its two major subcontractors both have very relevant experience in launch services and in development and production of a complex spacecraft. The major subcontractor for the launch service has extensive experience on the NASA Launch Services contract, which requires preparation, integration and launch service for high-value payloads and thus is very relevant to launching the CRS2 missions. They have demonstrated good project management. The subcontractor for vehicle processing and structure fabrication has good performance on the Orion contract, as well as experience on other relevant spacecraft work.

Sierra Nevada has experience working within a fixed price environment and for the most part has completed tasks on time and produced high quality work. They had schedule delays on their CCiCap and CCDev2 agreements. On CCiCap they had an overly aggressive schedule and met about half of their milestones on time, which I considered more significant than the SEB did. However, they responded to problems.

Price: The evaluated prices for both of Sierra Nevada's missions, inclusive of integration and adjustments, were the second lowest. They were somewhat higher than the lowest mission prices (Orbital's) and notably lower than the highest mission prices (SpaceX's). I noted that Sierra Nevada had higher integration prices than the other two proposals, but understood that the other offerors are building upon integration work already done under the CRS1 contracts. I agreed that the prices for the other CLINs (which were not evaluated but were assessed for reasonableness) were reasonable.

SpaceX

Mission Suitability: I noted that SpaceX's final proposal had the highest overall Mission Suitability score, and was rated Excellent in the two most important of the three Mission Suitability subfactors (Technical Approach and Management). The proposal was rated Good in the Small Business subfactor. I agree with this assessment.

SpaceX's proposal offers two standard missions, which both provide pressurized cargo delivery and return, as well as unpressurized cargo delivery and disposal. One mission type docks and the other berths to ISS. This approach covers the range of required mission services and enables delivery of both pressurized and unpressurized cargo on the same mission. It does not provide

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pressurized cargo disposal, buts meet the requirement to provide disposal or return, and cargo can also be disposed of by returning it to Earth.

Technical Approach: The proposal has several significant technical strengths as well as many strengths. The significant strength for the comprehensive set of capabilities is important because it offers a late load capability, rapid launch scrub turnaround, accelerated return of cargo, launch and landing at the same location, and additional power, which all contribute to meeting the ISS's needs as a research facility by providing timely transportation and handling of experiments and materials. However, I noted that for one of the two missions the accelerated cargo return is an option that would require additional cost. SpaceX's use of many heritage systems, including spacecraft that are derivatives of the flown Dragon and include systems already at high technology readiness levels, is a significant strength that reduces technical and schedule risk. Building on and leveraging not just the hardware, designs and systems but also the processes already used for ISS integration on other projects will enhance completion of ISS integration for CRS2, and the proposal has a detailed approach for the forward work. SpaceX's approach to doing most of the CRS2 work in-house minimizes, and therefore reduces risk from, external dependencies. SpaceX also uses a flown launch vehicle and ground infrastructure, which increases reliability, although I noted it had a recent launch failure and also noted that the version of the launch vehicle proposed for CRS2 has significant changes from the versions previously flown. However, by the time of CRS2 this launch vehicle will have many flown missions on other contracts. The launch abort capability is important because it reduces risk of complete loss of pressurized cargo in the event of a launch failure. Having a secondary launch pad at the same location enhances the certainty of maintaining the launch schedule. I questioned having only one landing site and questioned technical aspects of the vehicle's landing concept, but understood that other technologies on the vehicle, such as solar arrays, and the ability to remain longer on station provide some flexibility. SpaceX also has a launch-on-need capability, although this is an option that comes at additional cost. Several other strengths of the proposal increase NASA's manifest flexibility, such as the variability in cargo bags and ability to accommodate large bags. The frequency of launch and returns, long mating period at the ISS, port relocation, and ability to dock or berth at the ISS provides more flexibility for handling vehicle traffic to and from the ISS. SpaceX also has a good Mission Integration and Operations Management Plan.

Management Approach: SpaceX's management approach provides a team with significant experience, including experience with fixed price contracts and specifically with cargo supply services. The management structure is lean, which allows for quicker decision-making and responsiveness. I agree this is a significant strength to the proposal. I also noted the significant strength for leveraging the safety reviews and processes already used for the Dragon spacecraft on other efforts, specifically with regard to ISS operations, which will reduce risk and improve the safety and mission assurance for CRS2 flights by early identification of hazards and verifications.

Small Business Utilization: I also considered the strength for commitment to use small businesses, but did not find it to be a discriminator.

Past Performance: I agreed with the SEB's assessment of a High level of confidence in SpaceX's overall past performance. I considered that SpaceX has performed contracts and

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agreements that cover all aspects of the CRS2 scope of work, and has actually performed ISS cargo processing and integration, vehicle development, and ISS integration and operations and launch services in a fixed price environment. I found SpaceX's work on the current CRS1 contract for ISS resupply services, and the COTS funded agreement that developed the vehicles and demonstrated flights to the ISS, to be the most relevant of the various projects it has done although I also considered the company's other contracts and funded agreements. I found the company's work on its NLS contract to be more relevant than the SEB did; it involves launch vehicle preparation and integration and management of a technically complex activity, and SpaceX has progressed on two missions under this contract, including one mission nearing launch readiness. I noted the company's work on the funded CCiCap agreement, meeting most of its milestones on time. SpaceX has had technical issues that delayed its CRS1 and COTS flights, which I considered more significant than the SEB did, and has sometimes had issues with responsiveness due to its non-traditional project management and lean staffing. However, its schedule performance and responsiveness have improved and most of its contract objectives have been met. SpaceX recently had a catastrophic launch failure on the CRS1 contract, which I consider very significant. However, the company conducted an anomaly investigation to determine the cause and is cooperating with NASA and the FAA to resolve the problem and mitigate future risk. I also considered that past performance is about the offeror's overall performance; this launch failure was significant, but is not the only aspect of SpaceX's performance and SpaceX has successfully completed many other CRS1 missions. I also am aware of SpaceX's more recent work on other relevant contracts since the CRS1 mishap. The work on its Commercial Crew transportation contract has been solid and is directly applicable to this contract.

Price: The evaluated prices for both of SpaceX's missions, inclusive of integration and adjustments, were the highest of all the proposed mission prices. They were notably higher than the lowest mission prices (Orbital's) and somewhat higher than the next lowest mission prices (Sierra Nevada's). I asked the SEB about SpaceX's mission prices and understood that having two separate vehicles with separate production lines contributed to the prices, as well as the vehicle sizes which impact the cargo capacity and number of missions needed per year to deliver the required amount of upmass. SpaceX's integration prices were lower than Sierra Nevada's but higher than Orbital's. I agreed that the prices for the other CLINs (which were not evaluated but were assessed for reasonableness) were reasonable.

Comparative Assessment of Proposals

Price Comparison: I understood that the SEB's assessment of proposed prices for the contract line items (CLINs) other than CLIN 001A-D (mission prices) and CLIN 002A (ISS integration) was only for the purpose of verifying that those prices were reasonable, not for comparative purposes. Therefore, I focused on the evaluated prices for the missions and ISS integration, as calculated by the SEB in accordance with the instructions in the RFP. For each proposal, I understood the adjustments, if any, made as required in the RFP for use of Government property and time value of money.

Each offeror proposed two or three missions, with separate prices for each mission type. As required by the RFP, when a proposal offered multiple missions I considered all of the evaluated

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mission prices for the proposal, not just the lowest mission price or highest mission price. Orbital had the lowest prices, followed by Sierra Nevada, then SpaceX.

I noted that there was a wide range of evaluated mission prices, but consider that to be normal and expected in competitions for highly technically complex services where offerors have different vehicle designs, production and operational approaches, and ranges of capabilities. I asked about the formula established in the RFP for determining the evaluated mission prices, and understood that the upmass capacity of each proposed vehicle determined the number of flights the vehicle would need each year to transport the required amount of cargo. This price calculation approach was a reasonable way to evaluate prices for proposals that contain differences in capabilities. The price calculations were fair and consistent with the method for calculation established in the RFP.

Mission Suitability and Past Performance Comparison:

I considered that the purpose of the CRS2 contract is to provide a complete resupply service for the ISS, including delivering pressurized and unpressurized upmass, disposing of unneeded cargo, and returning cargo to Earth. According to the RFP, offerors may propose any combination of missions and capabilities to provide this service, with a preference for a more comprehensive complement of capabilities and more types of capabilities within a mission. I particularly considered the flexibility, risk, and reliability of the proposed approach and vehicles, and the forward plan for preparing the vehicles, accomplishing ISS integration, and conducting operations. I also considered each offeror's management of the proposed work and prior performance on similar work.

As stated in the RFP, Mission Suitability is more important than Past Performance. Of the three proposals, SpaceX has the highest Mission Suitability overall and also was rated Excellent in both of the two most heavily weighted subfactors (Technical and Management). Orbital and Sierra Nevada had almost exactly the same overall Mission Suitability scores. Sierra Nevada was rated Excellent in the most important subfactor (Technical) and Orbital was rated Very Good, although Orbital was rated Excellent in the Management subfactor and Sierra Nevada was rated Very Good. All three proposals were rated Good in the Small Business Utilization subfactor. All three proposals were rated as High in Past Performance.

As stated in the RFP, the offeror's Technical Approach is the most important part of the Mission Suitability evaluation. I began by considering the technical capabilities each proposal offered.

Technical Approach

Sierra Nevada has the most comprehensive set of mission capabilities, because one mission can provide all of the mission services (pressurized delivery, pressurized return and disposal, unpressurized delivery and disposal) and the vehicle capacity is the largest, accommodating the upper range of the required cargo mass and more than any of the other proposed vehicles, and accommodating the upper range of cargo bags. This provides more flexibility for cargo manifests and enables delivering more cargo in fewer flights.

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Orbital's vehicles provide a larger cargo capacity than the SpaceX vehicles, although less than Sierra Nevada's vehicles. Orbital's vehicles also accommodate the upper range of various pressurized and unpressurized cargo requirements, such as number and size of cargo bags. Orbital's approach meets the requirements of the RFP by providing pressurized upmass, unpressurized upmass and disposal, and pressurized disposal. Orbital has separate missions for pressurized and unpressurized cargo, whereas the other offerors can deliver both pressurized and unpressurized cargo on the same flight. Orbital removes cargo from the ISS via disposal, which is important. Other proposals provide a more comprehensive range of capabilities by providing return capabilities for pressurized cargo. Disposal of cargo can be accomplished after return.

SpaceX's vehicles have a smaller cargo capacity than the Orbital and Sierra Nevada vehicles, but provide pressurized and unpressurized cargo on the same mission rather than separate missions which is very useful for manifest flexibility. SpaceX provides the complete range of required cargo services because its return capability can also be used as a means of disposal. The vehicles also accommodate large and irregularly shaped cargo.

The ability to return cargo is critical for ISS science and operations and is an important capability to have in the portfolio of CRS2 providers. Both SpaceX and Sierra Nevada can return cargo whereas Orbital does not. Disposal of large quantities of cargo also is required. Orbital has significant disposal capability.

Sierra Nevada and SpaceX both offer missions that can either dock or berth with the ISS, which provides more flexibility for vehicle traffic and cargo transfer, whereas Orbital's missions only berth. Sierra Nevada and SpaceX also provide accelerated return, although this is at additional cost for one of SpaceX's two missions.

All of the proposals offer a range of other technical capabilities that are advantageous to the Agency's cargo resupply needs. All provide 24-hour launch scrub turnaround, can launch two out of every three days or better, can remain mated to the ISS for a more extended period than the minimum requirement, and can accommodate late cargo changes. All provide important late load capabilities and manifest flexibility to varying degrees. All three companies offer a launch-on-need capability, which increases launch date flexibility; this is included in the Orbital and Sierra Nevada missions but is an optional feature in the SpaceX missions. While all of these features are valuable for meeting research needs and providing ISS vehicle traffic flexibility, I do not find them to be discriminators because all of the proposals include them.

SpaceX is the only launch system that provides an abort capability, which is important because it significantly reduces the risk of complete loss of pressurized cargo in the event of a launch failure. This is a unique capability.

I also considered the offerors' respective launch sites. Sierra Nevada has one launch location in Florida. Orbital offers two launch locations, in Florida and Virginia, which reduces reliance on only one site. However, the different locations are because Orbital uses different launch vehicles for its different missions, and each vehicle only launches at one location. SpaceX has two available pads at its one launch location in Florida. This provides greater back-up capability for contingencies and greater launch flexibility because it is more viable to switch to another pad at

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the same location in the event of last-minute launch issues, than to transport the cargo to another launch location in another state to use the other launch vehicle. Utilizing the same launch vehicle at two pads also offers an advantage for mitigating launch pad problems.

I also thought the maturity of the proposed systems and forward development, including ISS integration, were very important. All proposals have a significant strength related to the maturity and flight heritage of aspects of their systems. Orbital's overall system is the most mature with the strongest heritage of the three. This more extensive heritage further reduces risk and increases reliability.

With regard to launch vehicles, Sierra Nevada proposes a launch vehicle and associated ground infrastructure with extensive heritage, which increases reliability and reduces technical and schedule risk, although these are new variants of the Atlas launch vehicle. SpaceX and Orbital also propose variants of launch vehicles that have flight history and have concepts of operations that are already in place. Orbital and Sierra Nevada both have planned mitigations to address the risk of their launch vehicles dependency on engines from foreign suppliers. In comparison, SpaceX's launch vehicles, as well as their spacecraft, are primarily built in-house, do not rely on suppliers for major components, and uses domestic suppliers, which provides a much greater reduction of risk.

SpaceX's and Orbital's spacecraft systems and designs, which are building upon systems that have already flown to and accomplished integration with the ISS, are more fully matured than those of Sierra Nevada. SpaceX and Orbital both propose heritage spacecraft systems derived from spacecraft already in use for other similar efforts, such as vehicles on their CRS1 contracts, or that will be variants of spacecraft already in development under other projects, such as SpaceX's vehicles under development in their contracts for commercial crew transportation. Both companies plan to leverage testing, ISS integration work, and other system certifications from these other projects to expedite completion of their CRS2 systems. Orbital has a clear plan for updating and adapting the systems and ISS certifications already done on the CRS1 contract for use with the CRS2 vehicles. Orbital has the strongest tie to existing systems. Orbital has flown once on an Atlas V, but is yet to fly or complete testing on their new re-engined Antares launcher. SpaceX had a very detailed plan for the forward work on the CRS2 systems, many of which are identical to the CRS1 and commercial crew systems, including sufficient schedule margin and ensuring ISS integration certification of the CRS2 spacecraft is not dependent on certification of the crew version. Sierra Nevada also is leveraging development and ISS certification work from prior commercial crew efforts and has continued to make progress on its vehicles, although I consider that Sierra Nevada's spacecraft system and designs are not as fully matured as those of SpaceX and Orbital. Sierra's flight vehicle and configuration is new and unflown.

The offerors' plan for delivering the resupply services, such as cargo integration and processing, key reviews and data products, and general mission operations is important for successful performance. Orbital, SpaceX, and Sierra Nevada all had clear, credible plans that addressed and showed understanding of the ISS requirements and concepts of operations.

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Management Approach

Management was the second most important subfactor of the Mission Suitability evaluation. Both Orbital and SpaceX have significant strengths for their experienced management teams, including considerable experience with fixed price contracts and specifically with cargo resupply work. Sierra Nevada has a strength for its experienced management team. SpaceX has a lean management structure, which is a benefit because it streamlines decision-making. Past performance indicated SpaceX previously had some challenges with its lean management structure, but has notably improved. Orbital's team and Sierra Nevada's team both include very experienced subcontractors, and Sierra Nevada has a very good approach for ensuring clear oversight and integration of its subcontractors, and past performance indicated good management of subcontractors. Orbital's past performance indicated effective management and integration of subcontractors, although there were some issues with engine manufactures that led to technical issues and delays. In contrast, SpaceX's approach does not rely on subcontractors.

Both Orbital and SpaceX have a significant strength for using modified versions of their spacecraft that have already been through ISS safety review processes and successfully operated with the ISS, which will enable earlier identification of hazards and thus improve safety and mission assurance for CRS2 operations. Sierra Nevada also will leverage prior spacecraft safety reviews, although unlike Orbital and SpaceX their vehicles have not been through a complete ISS process or operations.

I considered each proposal's approach to payment milestones, and lead times. I noted that Sierra Nevada had a strength for limiting milestone payments to reduce early financial risk to the Government, but also noted that it has higher ISS integration costs which will result in higher payments in the early months. I reviewed the proposed lead times for completing ISS integration and for flying missions. The ISS integration lead times were very similar for Orbital and Sierra Nevada, and a few months longer for SpaceX. The mission lead times for all three offerors were very similar, but some companies have more forward work than others and therefore I was concerned about the likelihood of their being ready for missions in the time proposed. Orbital proposed a shorter lead time for missions after the first mission. I inquired about that to ensure I understood the basis for it, and was satisfied with the SEB's explanation of the offeror's approach. Sierra Nevada had a weakness related to its mission lead time; my concern with this was not the number of months of lead time, which was similar to other proposals' lead times, but rather with the amount of development and integration work remaining to be done within that time for the first mission.

Small Business Utilization

I also considered the offerors' plans for using small businesses. I noted that SpaceX, Sierra Nevada, and Orbital all scored at the high end of the Good rating, for different reasons based on their different approaches, but did not find discriminators. Past performance indicated that Sierra Nevada and Orbital had established approaches for working with small businesses, although Orbital often did not meet its goals. SpaceX was a small business until recently, but its performance has shown it also has an established approach for using small businesses.

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Past Performance

In addition to consideration of offerors' past performance as it related to specific issues discussed above, I considered past performance overall as a general indicator of likely performance and reliability on the CRS2 contract.

Sierra Nevada, Orbital and SpaceX all had High ratings in Past Performance overall. Sierra Nevada and its team have experience with most of the scope of the CRS2 contract, although Sierra Nevada has not managed a project of this scale and does not have experience with on-orbit ISS work. Sierra Nevada does have very good technical performance and mostly good schedule performance, including a variety of efforts in a fixed price environment.

Orbital and SpaceX have the most directly relevant experience, having actually performed numerous cargo missions to and from the ISS. Both have had recent significant mishaps on this contract, but have taken corrective actions. While these incidents are very significant, I also considered the totality of each company's performance. Both have good performance on cargo processing and integration and ISS integration. Both Orbital and SpaceX recovered well from their failures. Both companies learned from these failures and will improve their processes and hardware as result of these failures. Orbital's failure resulted in damage to the launch pad which took extra effort for Orbital and its launch pad provider to repair. The schedule performance under CRS1 has been longer than proposed or envisioned, but having multiple providers has mitigated the schedule impact.

Sierra Nevada has a very reliable launch subcontractor with extensive and consistently successful performance, as does Orbital for one of its three missions. Orbital provides the launch vehicle and conducts the launch for its other two missions, and has performed well overall although it had significant launch failures. SpaceX also provides its launch vehicle and conducts its own launch, and has performed well with more cargo launches than Orbital although it also had schedule slips and a recent significant launch failure.

Trade-off Assessment

When assessing each proposal and comparing them to determine which proposal(s) best met the criteria in the RFP for successfully performing the requirements of the contract, I carefully considered the relative importance of the evaluation factors as stated in the RFP. As individual evaluation factors, Price was more important than Mission Suitability, which was more important than Past Performance. However, the combination of Mission Suitability and Past Performance together was approximately equal to Price.

Of the three proposals, Orbital's evaluated prices all were the lowest, followed by Sierra Nevada and then SpaceX. SpaceX had the highest Mission Suitability overall and rated Excellent in both the Technical and Management subfactors. Orbital and Sierra Nevada had almost exactly the same total Mission Suitability scores, although Sierra Nevada was rated Excellent in the more heavily weighted Technical subfactor while Orbital was rated Very Good. In the next most important Management subfactor, Orbital was rated Excellent and Sierra Nevada was rated Very

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Good. All three offerors were rated as Good in the Small Business subfactor. All three offerors were rated as a High level of confidence in Past Performance.

Of the three proposals, SpaceX has the highest prices but also has the highest Mission Suitability overall, and also was rated Excellent in both of the two most important subfactors (Technical and Management) whereas Orbital and Sierra Nevada each were rated Excellent in one subfactor and Very Good in another. I consider SpaceX's proposal worth the higher prices.

As compared to Orbital, SpaceX provides both provide pressurized and unpressurized cargo on the same mission rather than separate missions, which provides greater manifest flexibility. SpaceX also provides a more complete range of the required mission services, because its return capability is critical for ISS science and operations and can also be used as a means of disposal. SpaceX's missions can dock or berth with the ISS, which provides more flexibility for vehicle traffic and cargo transfer.

In comparison to both Orbital and Sierra Nevada, SpaceX's approach to doing most of the CRS2 work in-house reduces risk from external dependencies and can improve performance. Only SpaceX has an abort capability, which is a discriminator because it significantly reduces the risk of complete loss of the pressurized cargo in the event of a launch failure. I also consider SpaceX's launch site a discriminator. SpaceX has two available pads at its one launch location in Florida, which provides greater back-up capability for contingencies, greater launch flexibility, and greater certainty of maintaining the launch schedule. SpaceX has more directly relevant past performance than Sierra Nevada based on its experience with COTS and with the predecessor to this contract (CRS1), including its proven re-entry capability. SpaceX has performed well, despite one launch failure and schedule slips, and has had fewer launch failure and infrastructure problems than Orbital. I consider these various aspects of SpaceX's proposal to be discriminators that will provide a comprehensive, flexible, reliable resupply service that is worth the higher mission prices compared to Orbital and Sierra Nevada.

Sierra Nevada's prices also were higher than Orbital's prices. They have almost the same total Mission Suitability scores, although Sierra Nevada was rated Excellent in the most important Mission Suitability subfactor (Technical) and Orbital was rated Very Good. I consider Sierra Nevada's proposal worth the additional price.

Sierra Nevada provides the most comprehensive set of mission services, because it can provide both return and disposal and both pressurized and unpressurized upmass in the same mission. Sierra Nevada's vehicle also has the largest cargo capacity of all the proposed vehicles. These attributes provide greater manifest flexibility and can result in delivering more cargo in fewer flights. Sierra Nevada's missions can dock or berth with the ISS, which provides more flexibility for vehicle traffic and cargo transfer. Sierra Nevada also provides accelerated return, which supports ISS scientific research needs. Although Sierra Nevada has not managed a contract of this magnitude, it has a highly qualified team of proven subcontractors that gives me a high level of confidence in its ability to perform the CRS2 contract. Its approach of deploying subcontract management teams to its major subcontractors' locations also will increase its oversight. I consider these various aspects of Sierra Nevada's proposal to be discriminators that

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will provide a comprehensive, flexible, and reliable resupply service that is worth the higher mission prices compared to Orbital.

Orbital's proposal had the lowest mission prices of all the proposals, which is very important since Price is approximately as important as the combination of Mission Suitability and Past Performance. Orbital also had a strong Mission Suitability proposal, rated almost exactly the same as Sierra's, and had a High rating in Past Performance. Orbital provides the range of required mission services, including disposal which is an important capability. Orbital's proposal has several significant technical strengths. The pressurized cargo capacity of its vehicles exceeds the required minimum capacity considerably and is in the mid-to-upper range of the RFP requirements, and the unpressurized capacity is at the upper range, which provides more flexibility and results in needing fewer missions per year to transport the same amount of cargo. Several other features of its vehicles also exceed or are at the upper range of requirements. Other strengths in this proposal also contribute to manifest and cargo operations flexibility, and Orbital's use of heritage launch vehicle and ground infrastructure for one of its missions minimizes launch risk. Orbital's proposal was strong in Management and had several significant strengths. Orbital's team has experience with the scope of work of the CRS2 contract, directly relevant experience with the predecessor to this contract (CRS1), and overall past performance was good. Orbital did have launch failures and infrastructure issues, but has worked to resolve these issues, mitigate risks for future launches, and ensure completion of its contract commitments.

Selection Decision

The RFP stated that award would be made to one or more proposals that best met the evaluation criteria. The CRS2 contract will have a wide variety of manifest needs over the duration of the life of the ISS. Assured access is critical to ensuring the ISS can continue to operate, supporting the crew onboard, and conducting the vital research of a unique national lab. Awarding multiple contracts ensures the agency has access to different but redundant capabilities, which provides more options, increases flexibility for accommodating evolving manifest needs and unexpected contingencies, and reduces the risk of reliance on a single provider. Selecting multiple providers that provide a variety of cargo services through a variety of launch options provides the ISS program a robust portfolio of cargo services that will be necessary to maximize the utility of the ISS. All three proposals meet or exceed the requirements of the RFP and will provide good value to NASA and the ISS program. Based on my assessment of the proposals in relation to the RFP criteria, I select SpaceX, Sierra Nevada, and Orbital for the CRS2 contract.

William H. Gerstenmaier

William H. Gerstenmaier
Source Selection Authority

13 January 2016

Date