

**This JUSTIFICATION FOR OTHER THAN FULL AND OPEN COMPETITION
(JOFOC) as prepared by the
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA)
LYNDON B. JOHNSON SPACE CENTER (JSC)**

**Pursuant to 10 United States Code (U.S.C) 2304(c)(1) and Federal Acquisition Regulation
(FAR) 6.302-1**

**For the UNITED STATES (U.S.) ON-ORBIT SEGMENT INTERNATIONAL SPACE
STATION (ISS) VEHICLE SUSTAINING ENGINEERING CONTRACT NAS 15-10000**

1. FAR 6.303-2(b)(2) – The nature and/or description of the action being approved: This justification provides the rationale for contracting by other than full and open competition with The Boeing Company (Boeing) for the procurement of crew transportation services to and from the ISS on the Russian Soyuz vehicle. With this approval, NASA, JSC intends to issue a modification to the NAS 15-10000 Contract to add a Firm-Fixed-Price Contract Line Item (CLIN) to procure these transportation services, which include launch, return, rescue, and ancillary services to and from the ISS for one U.S. or U.S. designated crewmember in the Fall of 2017 and one crewmember in the Spring of 2018. The modification also will include a Firm-Fixed-Price option CLIN to acquire crew transportation for three crewmembers in 2019. NASA has service contracts with two U.S. commercial providers currently developing new crew transportation systems. The option for transportation services in 2019 allows NASA to ensure the availability of back-up transportation capability in the event the U.S. commercial contractors' vehicles are delayed or to augment future ISS operations and research.

2. FAR 6.303-2(b)(3) – A description of the supplies or services required to meet the agency's needs (including the estimated value): This proposed action will provide the Government with the ability to procure crew transportation services for two U.S. Operating Segment (USOS) crewmembers to and from the ISS on the Russian Soyuz vehicle in the Fall of 2017 and Spring of 2018, which will increase USOS crew size from three to four crewmembers to maximize ISS science utilization. This proposed action will also provide the Government with an option to procure transportation for three crewmembers in 2019 to and from the ISS on the Russian Soyuz vehicle to ensure the availability of back-up transportation capability in the event the U.S. commercial contractors' vehicles are delayed or to augment future ISS operations and research.

Maximizing science utilization of the ISS is a program priority as required by the NASA Authorization Act of 2010 and the Commercial Space Launch Competitiveness Act of 2015. Given these statutory requirements, NASA constantly seeks opportunities to maximize scientific utilization of the ISS to achieve the largest possible return on the investment made by the United States and its international partners in the development, assembly, and operations of this unique laboratory.

To achieve the requirements of the 2010 Authorization Act, NASA developed a long term plan in March 2011 to operate the ISS with four USOS crewmembers, instead of three, to maximize science utilization onboard. This four crewmember complement was planned to maximize crew

time available for research beginning in the spring of 2016. However, NASA has been unable to implement its planned increase to four crewmembers due to the unavailability of space transportation services from commercial domestic providers during the originally planned time frame. As a result, the current demand for scientific research on the ISS USOS exceeds the capacity of the current three USOS crewmember complement.

Additionally, science utilization crew time may be adversely affected by routine maintenance and operation activities necessary to sustain the serviceability of the ISS. For example, future sustainment activities include items such as Battery change-outs (Lithium Ion in place of Nickel Hydride) in 2017, a possible Ammonia Tank Assembly replacement by the end of 2017, a Pump Flow Control System replacement in 2018, and four pre-positioned spares that will support external corrective maintenance. These necessary sustainment activities will limit the crew time available for science utilization. An additional crew member during these time frames will allow the Government to increase research and utilization in light of normal maintenance activities.

Daily operations and research onboard the ISS also directly influences building the required knowledge to support missions to Mars and beyond. The data yielded from ISS scientific studies, which is fostered by international relations in the corporate, private, and academic scientific communities, is applied to theoretical, strategic, and tactical planning required for success in exploration beyond low earth orbit. Further, the execution of continuous on-orbit operations aboard the ISS facilitates gaining experience in executing best practices associated with mission control and vehicle operations. As a result, necessary technology is developed and proven to: expand capability of automated systems, formulate and test plans for solar array maintenance, extend capacities of power systems, refine water processing devices and water management strategies, design and test orbital habitats, engineer methods to extend shelf life of nonperishable supplies, and train crewmembers to thrive while supporting long duration missions.

Increasing the USOS crew size from three to four during this period will result in more available crew time to support research onboard the ISS, thereby maximizing utilization through augmentation of ISS operations and research capabilities while increasing the return on investment for the application of ISS operations for Mars and exploration missions beyond. Specifically, the increase to a four member crew would nearly double the amount of available crew time for weekly research (from a minimum of 35 hours/week to a minimum of 68 hours/week).

NASA also has a need for an option to procure crew transportation services in the spring of 2019 time frame to provide either a primary or a back-up crew transportation capability. An option for transportation services in 2019, which can be ordered in the fall of 2017 rather than now, will allow NASA to evaluate the performance of U.S. crew transportation services providers currently on contract and determine if back-up capability is needed or if more crew time may be necessary to maximize research onboard the ISS and the U.S. National Laboratory in 2019. Crew transportation services are currently provided via a contract with the Russian State Space Corporation "Roscosmos" through 2018. NASA also has contracts with two U.S. commercial

providers developing new crew transportation systems. However, these vehicles are still in the developmental stage and are not expected to begin fully operational flights to the ISS until 2019.

In the event the U.S. commercial crew providers are delayed in demonstrating a fully operational capability to transport humans to space, the risk of de-crewing ISS greatly increases. The absence of U.S. crewmembers at any point would diminish ISS operations to an inoperable state. As a means to mitigate that risk, and to ensure that proper launch cadence is maintained for future launches to the ISS, NASA intends to include a contract option with Boeing for its Soyuz seats in Calendar Year (CY) 2019 that will provide NASA with a capability to ensure uninterrupted access to the ISS while U.S. commercial providers establish that their vehicles have full operational capability or provide for more crew time to maximize research onboard the ISS and the U.S. National Laboratory in 2019.

Consequently, there may be a period of time where crew transportation services provided by Boeing under this proposed action may overlap with U.S. commercial providers. However, once the U.S. commercial providers are fully operational and able to fulfill crew requirements, the U.S. commercial vehicles will be NASA's primary crew transportation source to ISS.

The services NASA is considering acquiring from Boeing are the launch, return, and rescue of U.S. or U.S. designated astronauts and associated services, which include the following:

- Launch and return of USOS Crew members to the ISS for planned 6-month missions.
- On-orbit rescue services for the duration of 6-month missions.
- Provision of Emergency Rescue services and medical support, post flight medical support.
- Search and Rescue services and recovery at landing site.
- Theoretical and practical training of Astronauts for nominal, off nominal and sea survival activities.
- Customized Astronaut launch, training, and landing gear including: Seat liners, Sokol, Water Survival Cold Weather, and Elemental Survival suits.
- Media personnel technical and logistical support to facilitate broadcasting of flight related activities, facilitating the communication of NASA and ISS success to the world.
- Ground support and transportation for up to 110 NASA personnel and delegates for launch, landing, and associated events including visa support, housing, logistics, security, and clearance for facility access.
- Limited cargo services for storage, delivery to, and return from the ISS including disposal of trash from the ISS for cargo associated with crew delivery and return.
- Spacecraft telemetry and support services for all stages of flight.

The estimated value of this action and Option 1 is [REDACTED] and [REDACTED], respectively. Therefore, the total estimated cost for the effort is [REDACTED].

3. FAR 6.303-2(b)(4) – An identification of the statutory authority permitting other than full and open competition: 10 U.S.C 2304 requires, with certain limited exceptions, that agencies shall promote and provide for full and open competition in soliciting offers and awarding Government contracts. Under limited circumstances, agencies are authorized to award contracts that restrict competition on a sole-source basis. Per FAR 2.101, a sole source acquisition means, “a contract for the purchase of supplies or services that is entered into or proposed to be entered into by an agency after soliciting and negotiating with only one source.”

The statutory authority for proceeding with this acquisition under other than full and open competition is 10 U.S.C. 2304(c)(1), as contemplated by the provision of FAR 6.302-1(a)(2), which states that full and open competition need not be provided when the services required by the Agency are available from only one responsible source and no other type of services will satisfy Agency requirements.

4. FAR 6.303-2(b)(5) – A demonstration that the proposed contractor’s unique qualifications or the nature of the acquisition requires use of the authority cited and any other facts supporting the use of other than full and open competition: A decision was made to retire NASA’s sole crew space transportation vehicle (the Space Shuttle) in 2011. Since the Space Shuttle retirement, the Russian Soyuz has been the only vehicle available for safely transporting humans from earth to low Earth orbit and docking with the ISS. To date, no other vehicle has demonstrated the technical capabilities to meet NASA’s requirements for ISS crew services.

NASA has contracts with two U.S. commercial providers developing new crew transportation systems. However, these vehicles are still in the developmental stage and not expected to begin fully operational flights to the ISS until 2019. Both contractors require more time to complete design, production, testing, and certification of their vehicles and operations infrastructure before docking and providing crew transportation services to ISS. As these vehicles have not yet completed all certification requirements, and based on the current schedule for operational readiness, NASA’s commercial providers are not currently able to provide crew transportation services to and from the ISS during the Fall 2017 and Spring 2018 time frames.

As such, the Russian Soyuz is currently the only vehicle with the operational capability to provide crew services to and from the ISS in 2017 and 2018. There are eight Soyuz launches planned between CYs 2017 and 2018 (four per year). The crew capacity of the Soyuz is limited to a maximum of three crewmembers per vehicle. Because of this limitation, the current launch cadence utilized by NASA to transport crew to the ISS and maintain the current crew complement employs Soyuz launches that alternate between two types of crew configurations. The first Soyuz configuration ("Line A") includes a single U.S. crewmember and two Russian crewmembers. The second Soyuz configuration ("Line B"), usually timed to launch within a couple months of Line A, includes two U.S. crewmembers and a single Russian crewmember. This cadence maintains a typical crew complement of three U.S. crewmembers aboard the ISS.

An agreement was recently reached between Boeing and S.P. Korolev Rocket and Space Public Corporation, Energia ("RSC Energia"), who is the manufacturer of the Soyuz spacecraft and has the legal rights to sell the seats and associated services. As a part of this agreement, Energia agreed to provide to Boeing two specifically identified seats on the Soyuz spacecraft for long-duration travel to and from the ISS, one on a flight to occur in the Fall 2017 timeframe and another on a flight to occur in the Spring 2018 timeframe. Additionally, Energia provided Boeing three additional specifically identified seats in the Spring 2019 timeframe on two Soyuz spacecraft. Finally, Boeing and RSC Energia agreed that each of these five seats will include all services normally provided during launches to ISS. Boeing and RSC Energia have confirmed in writing that Boeing has the full rights to these seats and can sell them to any third party.

The subject acquisition with Boeing will enable NASA to accomplish its statutory requirements and ISS mission requirements to meet obligations under international agreements with NASA's International Partners and to protect a multibillion dollar U.S. investment.

5. FAR 6.303-2(b)(6) – A description of the efforts made to ensure that offerors are solicited from as many potential sources as practicable, including whether a notice was or will be publicized as required by Subpart 5.2 and, if not, which exception under 5.202 applies: On January 17, 2017, a non-competitive synopsis, NNJ17ZBG001L, was issued on FedBizOpps.gov for the proposed services to be performed by this contract with a closing date of January 27, 2017. The synopsis stated the Government's intent to contract with Boeing for these services on a sole source basis for two Soyuz seats and associated services in the Fall 2017 time frame and the Spring 2018 time frame, with an option to procure three additional seats and associated services in the Spring 2019 time frame, which includes rescue/return services through the end of CY 2019.

6. FAR 6.303-2(b)(7) A determination by the contracting officer that the anticipated cost to the Government will be fair and reasonable: A price analysis will be performed in accordance with FAR 15.403-3(c)(1). The anticipated price will be compared to an Independent Government Estimate that was developed by using information from various sources, including historical prices paid by the Government for equivalent Soyuz crew services. Based on internal estimates for this proposed action, the Government estimates the value of this procurement to be \$375 million. This is estimated at or below historical prices for Soyuz seats purchased directly from Roscosmos State Corporation, which would project costs for these same services to exceed \$420 million.

7. FAR 6.303-2(b)(8) – A description of the market survey conducted, and the results, or a statement of the reasons a market survey was not conducted: Non-competitive synopsis, NNJ17ZBG001L, served as a market survey for the proposed contract modification. Based on this market research, NASA has determined that there are no firms with the capabilities necessary to meet NASA's requirements. NASA concluded that Boeing is the only responsible source available to meet the requirements.

8. FAR 6.303-2(b)(9) – Any other facts supporting the use of other than full and open competition, such as: Russia recently announced its plans to decrement the Russian crew count onboard ISS from three to two, beginning in CY 2017. As a result of Russia reducing its crew count by one crewmember, there is now an available Soyuz seat in the 2017-2018 timeframe on each of the two planned spacecraft that would have otherwise had two Russian crew aboard. Of the 24 total Soyuz seats available in 2017-2018, the three seats resulting from the Russian crew decrement are the only available means of transporting additional U.S. crewmembers to ISS during this period.

Figure 1: Planned Launch Cadence and Crew Rotation to ISS (dates subject to change)

	2017												2018											
	January	February	March	April	May	June	July	August	September	October	November	December	January	February	March	April	May	June	July	August	September	October	November	December
Line A Launch			↑						↑						↑						↑			
USOS Crew			1						1						1						1			
Russian Crew			1						1						1						2			
Open			1						1						1						0			
Line B Launch					↑					↑							↑						↑	
USOS Crew					2					2							2						2	
Russian Crew					1					1							1						1	
Open					0					0							0						0	

Until alternative space transportation services become available, the Russian Soyuz is currently the only vehicle that is capable of meeting the Government’s needs in the required timeframes. Since Boeing has the exclusive rights to these Soyuz seats, Boeing is the only source available to provide crew transportation to and from the ISS, including ancillary services, in the time frames needed by NASA in 2017 and 2018, and to provide a primary or back-up capability in 2019 if needed.

9. FAR 6.303-2(b)(10) – A listing of the sources, if any, that expressed an interest in writing in the acquisition: As stated in item 7 above, synopsis number NNJ17ZBG001L was posted to FedBizOpps.gov. This notice requested potential sources to submit their capabilities and qualifications. A written response was received by NASA on January 26, 2017, from Spacedesign Corporation. NASA engaged in a detailed analysis and evaluation of Spacedesign Corporation’s response to determine if they have the capabilities to meet NASA’s requirements.

Upon completing the detailed review and analysis, NASA determined that Spacedesign Corporation’s response does not demonstrate the capabilities to meet NASA’s requirements. Specifically, its response did not provide a viable space transportation service that demonstrates proven and reliable operational capability during the timeframes required for this acquisition. The Government has formally notified Spacedesign Corporation of this decision.

10. FAR 6.303-2(b)(11) – A statement of the actions, if any, the agency may take to remove or overcome barriers to competition before any subsequent acquisition for the supplies or services required: This contract action will provide the Government the ability to procure these crew transportation services until U.S. commercial space transportation service providers can demonstrate a proven and reliable operational capability. NASA has awarded contracts to two U.S. commercial contractors to fulfill its requirement for U.S. domestic ISS space transportation services to low Earth orbit. While NASA has already placed orders against these contracts, both contractors must complete design, production, testing, and certification of their vehicles and operations infrastructure prior to performing demonstration and crewed flights.

These services described within this document will augment both the current U.S. crew transportation services contracts and Soyuz seat purchases previously purchased by NASA. These services will not replace or diminish any of the competitively awarded requirements with the domestic commercial providers.

Since both U.S. commercial contractors' vehicles are still in the developmental stage, and not expected to begin fully operational flights to the ISS until 2019, the Russian Soyuz is currently the only vehicle capable of meeting the Government's needs in the required timeframes. As stated above, Boeing has obtained the exclusive ownership rights to these particular Soyuz seats and ancillary services during the stated time periods. The option for these Soyuz services in the Spring of 2019 time frame may be utilized as a primary or backup transportation capability to ensure proper launch cadence with no gaps in crew rotation transportation, or to augment future ISS operations and research. However, after U.S. commercial entities are fully operational and able to fulfill crew transportation requirements, the U.S. commercial vehicles will be NASA's primary transportation source to ISS.