

# Strategy Research Project

## Request and Requirements Development Process for Operationally Responsive Space Capabilities

by

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United States Army War College  
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## Abstract

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Joint Force Commanders continually submit Joint Urgent Operational Need Statements identifying communications, surveillance, reconnaissance, and early warning capability gaps. Operationally Responsive Space (ORS) concepts and capabilities have emerged as a potential solution for filling Joint Commander's needs. The ORS office is responsible for developing low-cost, rapid reaction payloads, buses, space lift, and launch control capabilities in order to fulfill joint military operational requirements for on-demand space support and reconstitution. The ORS office and USATRATCOM have developed a request and solutions process to employ responsive space capabilities. The processes fall short in defining responsive space required capabilities and validating the requirements within the Department of Defense's program acquisition framework. The lack of validated requirements has led to continuous funding issues, lack of understanding of responsive space concepts, and continued debate over the validity of the programs.





## **Request and Requirements Development Process for Operationally Responsive Space Capabilities**

The Department of Defense defines Operationally Responsive Space as, “Assured space power focused on timely satisfaction of Joint Force Commanders’ needs.”

—Department of Defense

Leading military space experts regard OPERATION DESERT STORM as America’s first space war.<sup>1</sup> It has been over twenty years since the completion of OPERATION DESERT STORM and the United States Army’s reliance and dependence on space capabilities has grown exponentially. Unfortunately, the demand for space capabilities continues to outweigh existing on orbit capabilities.<sup>2</sup> As the Services develop concepts and identify requirements to fill gaps within the space domain, Operationally Responsive Space (ORS) capabilities have emerged as a potential solution.

The newly established ORS office, in conjunction with United States Strategic Command (USSTRATCOM), defined a request and solutions development process to employ responsive space capabilities. The process falls short in defining responsive space required capabilities and validating the requirements within the Department of Defense’s program acquisition framework. The lack of validated requirements has led to continuous funding issues, lack of understanding of responsive space concepts, and continued debate over the validity of the programs. The ORS community must leverage the Department of Defense’s acquisition system to develop and build standardized systems, document emerging technologies for future capabilities, and validate concepts of operations for on-demand capabilities. This paper will primarily focus on the request

processes for developing Tier 2 - Deploy and Tier 3 - Develop solutions. The paper will also only focus on development and building of the satellites/buses and payloads/sensors capabilities. This research will not address the ability to launch a responsive space capability with current or future lift capabilities.

### Responsive Space Needs

At the highest national levels, the importance of ORS capabilities has gained significant footing. The White House highlighted specific guidance on ORS capabilities on the White House website, under defense issues.

Space: The full spectrum of U.S. military capabilities depends on our space systems. To maintain our technological edge and protect assets in this domain, we will cooperate continue to invest in next-generation capabilities such as operationally responsive space and global positioning systems. We will cooperate with our allies and the private sector to identify and protect against intentional and unintentional threats to U.S. and allied space capabilities.<sup>3</sup>

Combatant Commanders (CCDR) and Joint Force Commanders (JFC) have identified numerous communications, surveillance, collections, and navigation shortfalls that space capabilities could provide solutions. In 2007, as part of the John Warner National Defense Authorization Act, Congress required the Secretary of Defense to establish an Operationally Responsive Space office to develop low-cost, rapid reaction payloads, buses, space lift, and launch control capabilities in order to fulfill joint military operational requirements for on-demand space support and reconstitution.<sup>4</sup>

The concept of responsive space is to deliver space capabilities through timely deployment of emerging technology, augmentation of existing assets, reconstitution of degraded capability, and/or filling unanticipated gaps to satisfy a Joint Force Commander's needs.<sup>5</sup> The ORS office is responsible for developing and providing responsive space needs to the JFCs. The mission of the ORS Office is to plan and

prepare for the rapid development of highly responsive space capabilities that enable delivery of timely warfighter effects and, when directed, develop and support deployment of operations of these capabilities to enhance and assure support to Joint Force Commanders' and other users' needs for on-demand space support, augmentation, and reconstitution.<sup>6</sup>

Even though the ORS office is the focal point for answering JFCs responsive space needs, the office realizes there are additional efforts conducted by the Services, Intelligence Community, and Inter-Agency partners to provide responsive capabilities to users.<sup>7</sup> To categorize the different possibilities for solutions, the ORS office has developed a three-tiered approach to define responsiveness space capabilities.

- Tier 1: Employ – On-demand use of existing deployment assets in applications that may extend or expand their original purpose. The objective of Tier 1 is to deliver these capabilities within minutes to hours.
- Tier 2: Deploy – Deploying new or additional capabilities that are field-ready; that is, already produced. The launch of on-demand small, operational satellites is an example of Tier 2 solutions. The objective of Tier 2 is to deliver capabilities with days to weeks.
- Tier 3: Develop – The rapid development, delivery, and employment of a new capability. ORS solutions will focus on rapid development of capabilities from JFC's urgent needs. The objective of Tier 3 is to deliver capabilities within months and less than one year.<sup>8</sup>

From the Joint Commanders perspective, the definition of the tiered categories is immaterial to the type of request they submit. They identify an urgent capability gap and

request resources be applied to fill the requirement within a specified time. The three tiers determine the ability for the ORS office to develop potential solutions with a defined timeline.

### Request Process

JFCs and Services primarily use the Joint Urgent Operational Need (JUON) statement process to submit ORS type requests. However, commanders can also submit urgent needs using the Evaluation Request Messages (EReQMs) or Request for Forces (RFF) process. USSTRATCOM has received operational urgent need statements from JFCs that focus on three space enhancement areas or missions: satellite communications (SATCOM); intelligence, surveillance, and reconnaissance (ISR); and early warning. They have also received a Space Control mission area request to satisfy a space situational awareness (SSA) needs.

- The Commanders, Joint Task Force for Global Network Operations (JTF – GNO) submitted an operational needs statement in 2007 for Ultra High Frequency (UHF) Satellite Communications (SATCOM) shortfalls. The urgent UHF request will support multiple Combatant Commanders needs, as highlighted during the Geographic Combatant Commander's, Joint Net Centric Operations Senior Warfighter Forum in April 2007. The shortfall highlights additional communications support requirements for special operations and mobile users. The urgent need is supported by the Joint Requirements Oversight (JROC) approved Mobile User Objective System (MUOS) Operational Requirements Document.<sup>9</sup>

- The Deputy Commander, United States Central Command (USSCENTCOM) and the Deputy Commander, Joint Functional Component Commander for Intelligence, Surveillance, and Reconnaissance (JFCC-ISR) submitted an urgent ISR need in 2008. The request for the ISR urgent need was based on a JROC approved Future Imagery Architecture Statement of Requirements. The urgent needs request stipulated an operational capability need within the 2008-2011 timeframe.<sup>10</sup>
- The Joint Functional Component Command – Space (JFCC-Space) submitted an Operational Needs statement in 2007. JFCC-Space requested a need to review and identify near-term material and non-material options to improve deep space surveillance capabilities. Solutions must consider the current common operational picture and need for command and control for SSA.<sup>11</sup>
- In December 2010, USSTRATCOM submitted a missile warning risk mitigation urgent need. The urgent need request was intended to study augmentation alternatives to fill the missile warning capabilities gap between the Defense Support Program and employment of the new Space-Based Infrared System.<sup>12</sup>

The fundamental difference between the traditional space acquisition requirements development process and ORS is the focus on providing timely capabilities based on JFC's urgent needs – commanders drive the demand. In the past, national space capabilities requirements dictated the design and building of space assets. The concept of operations for ORS is to develop capabilities directly from

operational needs request from the commanders to benefit users from the Joint Task Force to the tactical users.<sup>13</sup> Commanders urgent need requests drive requirements for responsive space capabilities. The basis for all of the responsive space initiatives, technology development, demonstrations, and programs should originate from a desire to satisfy commander's needs requests. The ORS communities' ability to focus on fulfilling only the commander's needs and not continually adding additional requirements onto the solution contributes to the program's success. National acquisition program requirements do not drive ORS programs and solutions. However, an ORS solution may augment or satisfy a gap that a national space capability is currently not providing. In no way are ORS solutions designed to replace national systems, but will complement or augment their capabilities.<sup>14</sup>

Once a JFC submits an urgent needs requirement request, the users need is submitted to USSSTRATCOM. USSTRATCOM has developed a four step initial concept of operations process to determine success of an ORS mission.<sup>15</sup>

1. Establish Need: Identify and clearly articulate the JFC and other user-defined need
2. Define Approach: Participate in the development of courses of action
3. Provide capability: Advocate for and oversee the development of solutions
4. Deploy and Employ: conduct operations to provide the required capability to the requesting JFC

The ORS office's official request and requirements process role begins with step two of the USTRATCOM process – Define Approach. The ORS office has developed a request process that allows them to take urgent operational requirements from

combatant commanders and identify potential solutions within a short period of time (figure 1).<sup>16</sup> The process applies a community of practice approach for processing request, modifying requirements, and determining potential solutions. The community of practice incorporates and integrates ongoing efforts from each of the Services, governmental space organizations, industry partners, as well as the customer to determine potential space solutions. One of the key components to this process is the continuous input and feedback from the JFC or originating requestor. When the approach team develops potential solutions, based on the requirements and tiered category, the approach team forwards the proposed solution back to USSTRATCOM Commander for review and concurrence. This portion of the process should take 5-30 days to complete. The process may take longer depending on the complexity of the requirement. USSTRATCOM then forwards the ORS space solutions to the Executive Agent for Space, Secretary of the Air Force<sup>17</sup> for final approval. Upon final approval, the ORS office begins execution of building and delivering the capability to the JFC.

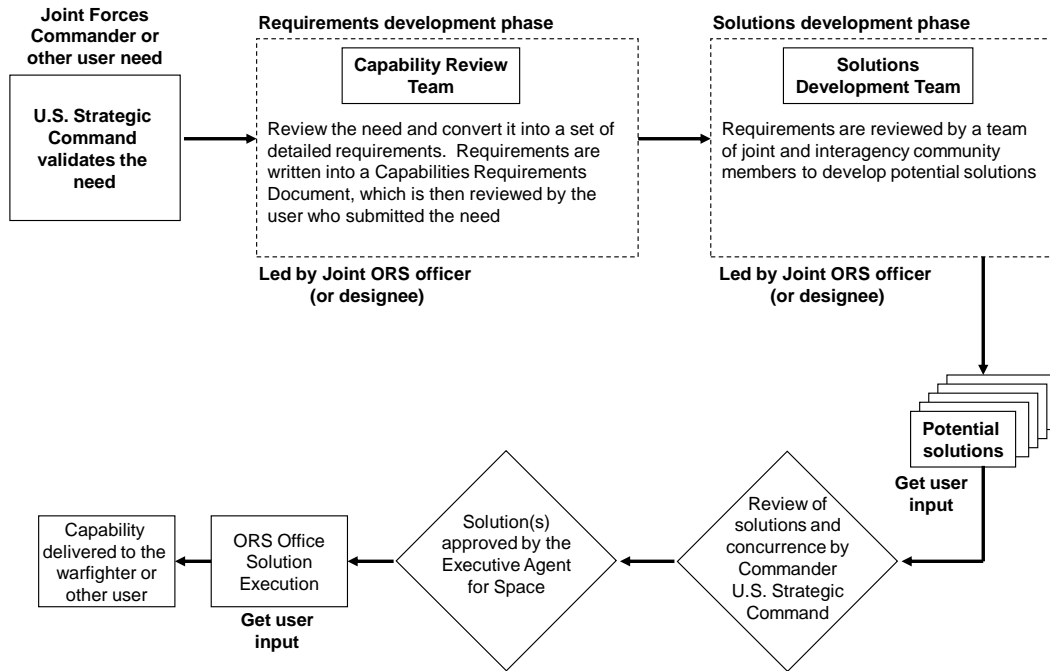


Figure 1: The ORS Requirements and Solutions Generation Process<sup>18</sup>  
Operational Capability

The launch of Tactical Satellite – 3 (TacSat-3) was the ORS office’s and developmental team’s first effort to fulfill a JFC’s operational needs. TacSat-3 included three distinct payloads: the Advanced Responsive Tactically Effective Military Imaging Spectrometer hyperspectral imager; a Satellite Communications Package to collect data from sea-based buoys and transmit information back to a ground station for expeditious communication to the warfighter; and the Space Avionics Experiment to validate plug-and-play avionics capability. The spacecraft successfully launched into orbit on May 19, 2009.

TacSat-3 was the first program chosen through a formal ORS selection process that included: solicitation of white paper needs statements from Combatant Commanders (COCOMs), services, and other requirements



organizations; review by a multi-service senior board; and a final recommendation by a multi-service General Officer Board. The Department of Defense, Executive Agent for Space selected a hyper-spectral imagery technology demonstration as the mission for TacSat-3 in early 2005.<sup>19</sup>

Operationally Responsive Space – 1 (ORS-1) is a responsive space solution that used existing technology to build and employ a capability for a CCDR. ORS-1 leveraged TactSat-3 bus technology to host an existing imagery capability from the U-2 ISR air platform. USCENTCOM issued an Urgent Need for a space-based ISR capability, which USSTRATCOM, the ORS office and Air Force Space Command satisfied by developing and employing with operational use of ORS-1. The Joint Requirements Oversight Council (JROC) approved ORS-1 operational need based on the validated Future Imagery Architecture Statement of Requirements. The Commander, USSTRATCOM assigned responsibility to develop and provide potential solutions for the urgent need to the ORS office. ORS-1 is an imagery intelligence gap-filler, giving United States Central Command (USCENTCOM) a tactically responsive platform to augment high demand, low density airborne ISR in the CENTCOM Area of Responsibility (AOR).<sup>20</sup> ORS-1 was the first and only dedicated space intelligence capability for USCENTCOM.<sup>21</sup>

The timeline for program approval to launch of ORS-1 was 32 months: program approved, OCT 08; build decision, JUL 09; and ORS-1 launched, JUN11.<sup>22</sup> ORS-1 is a Tier-3 solution, since the timeline from program approval to launch exceeded the threshold for Tier-2 solution. The program team was able to build the satellite in a significantly reduced period by leveraging an existing satellite bus, imagery sensor technology from air breathing system, and leveraging existing systems communications package technology. Even though the team used existing technology, ORS-1 did not use plug and play capabilities. For future on-demand space capabilities solutions to

support Tier 2 and Tier 3 timelines, more developed or built capabilities are going to need to be available. The ORS community needs to develop plug and play or modular type capabilities, with standardized on the shelf systems (buses and sensors) readily available for employment. Once a JFC submits an urgent needs request, with an ORS recommended solution, engineers can modify the satellite payload with specific sensors then assemble with a bus to meet specific capabilities. Unfortunately, funding is not currently available for the ORS community to build plug and play type systems. The lack of clearly defined responsive space requirements is a contributing factor to funding issues for the community.

Another important aspect of the ORS concept of operation that has enabled the community to launch capabilities like ORS-1 and conduct multiple experiments and demonstrations is the philosophy of “good enough”. To the greatest extent possible, the ORS community builds capabilities to satisfy the original JFC’s urgent need statements, without adding additional requirements or capabilities. The ORS office is “taking a new approach to risk and mission assurance to rapidly deploy capabilities that are ‘good enough’ to satisfy warfighter needs across the entire spectrum of operations, from peacetime through conflict.”<sup>23</sup> This philosophy does not mean the ORS community is willing to deliver a system to the warfighter that does not meet the defined requirements. The delivery of good enough capabilities effectively satisfies the urgent need and within an acceptable time period. Surprisingly, the good enough method for delivering capabilities to the commanders aligns with the acquisitions communities’ traditional description of meeting deliberate and rapid requirements. Normally the deliberate acquisitions process attempts to meet the goal of 99 percent solution. To meet this

extreme goal, deliberate acquisition programs can take 3 to 11 years to deliver. While the rapid acquisition process attempts to satisfy, 75 percent or less of the requirements, so deliver of a capability takes 24 months or less.<sup>24</sup>

### Requirements Development

Recently, the USSTRATCOM Commander directed two overarching goals for the ORS office. First, “build the enabling infrastructure and contingency operations to deploy existing capabilities in 6 days, and new capabilities in less than one year.”<sup>25</sup> Second, “respond to urgent needs of the Joint Force Commanders.”<sup>26</sup> To meet these goals, the ORS office has developed a concept of payload flexibility and bus flexibility/compatibility – plug and play capabilities. Even though ORS-1 did not use plug and play components, the satellite bus demonstrated the concept of compatibility by leveraging and using technology from a previous successfully launched responsive space capability. While the ORS-1 imagery sensor on the satellite, was developed using existing technology from an ISR air system. The plug and play concept utilized existing buses and modular payloads available for configuration to meet the specific JFC’s need. To maximize the interoperability the responsive systems plug and play capabilities must be compatible with each service’s architecture, automation, and process in order to meet developmental timelines and budget constraints.<sup>27</sup> To build and maintain plug and play capabilities, the ORS community will need program funding. The way to generate program funding is to identify and validate responsive space capabilities requirements.

The ORS community has done an incredible job leveraging multiple organizations to contribute to the success of fulfilling JFC’s urgent needs. The community has sought solutions and input from science and technology organizations, academia, commercial industry, and services’ labs. They are also gaining input for

concepts development and solutions from services battle labs, joint wargames and exercise, modeling and simulation, and joint forces. To deliver capabilities in a relatively short period, compared to historical space acquisitions timelines and costs, the ORS community has developed solutions by going from the experimentation and demonstration to fully operational capabilities supporting joint forces and tactical users.<sup>28</sup>

Over the past year there has been much discussion on the future of ORS. Budget cuts have threatened to reduce funding of the program or even close the office<sup>29</sup>. The argument normally centers on the balance between funding and investing in traditional existing large satellite programs for smaller cheaper responsive systems. The dilemma or shortfall for the responsive space argument tends to fall back to a lack of clearly defined and validated capabilities documents. For operational demonstrations, the ORS office is not required to follow the Joint Capabilities Integration and Development System (JCIDS) process, as outlined in the 2007 Defense Authorization Act. JCIDS is the Department of Defense requirements generation process that the Services are required to use to identify capability needs. Currently, the ORS community does not have any Initial Capabilities Documents (ICD), Capability Development Documents (CDD), or Capabilities Production Documents (CPD) to define requirements for responsive space capabilities. Since the JCIDS process is not designed or required for delivering urgent needs to JFCs, JCIDS requirements documents would not be used for Tier 1 or limited Tier 2 solutions. However, for most Tier 2 and all of Tier 3 solutions would necessitate the acquisition of an operational capability that might include a set number of satellite buses and standardized payloads ready for rapid launch.<sup>30</sup> To

establish a responsive space plug and play programmed capability that is readily available to support JFC's urgent needs, the ORS community will be required to develop JCIDS documents.

The ICD is the fundamental document that defines and outlines the user requirements and describe how the capability supports joint concepts. An ICD validates the capabilities required to perform the mission as defined; the gap in capabilities along with their priorities and operational risks; and the need to address the capability gaps.<sup>31</sup> The intent of a responsive space ICD is not to validate the requirements for space-based systems, but to validate the requirement for responsive space capabilities and concepts. The responsive space ICD will: validate space capabilities needs – standardized buses and payloads; determine levels of performance – how responsive space capabilities will augment, compliment, reconstitute national capabilities and leverage new technology to enable Joint Task Forces and tactical warfighters; and define the timelines for employment – validating and describing the Tier 1, 2, and 3 categories.

The CDD identifies operational performance attributes of the proposed system and validates the key performance parameters with associated thresholds, objectives, and affordability of the system as compared to the delivered operational capability. The CDD outlines an affordable increment of militarily useful and technically mature capability. The CDD may define multiple increments if there is sufficient definition of the performance attributes, key performance parameter, or key system attributes to allow approval of multiple increments.<sup>32</sup> This would apply to responsive space plug and play capabilities as the community identifies requirements for multiple type buses and

payload sensors. A concept of operations for developing multiple buses included operating in two type's orbits – Low Earth Orbit (LEO) and Highly Elliptical Orbit (HEO). Each of these orbits would require different specifications and engineering requirements. LEO satellites would primarily host imagery and communications packages. The imagery systems would normally require a slew or orientation capability to a spot on the earth to capture a picture. The LEO satellites will primarily host signal intelligence or potentially early warning infrared sensors. LEO buses will primarily have wide area fields of view to enable greater search areas.<sup>33</sup> Since each of these orbits requires different technical solutions, it will require building several types of compatible plug and play buses.

In addition, responsive space satellites will require access to several different types of sensors. These sensors would support Space Force Enhancements (satellite communications; early warning; intelligence, surveillance, and reconnaissance; position, navigation, and timing; and weather), Space Situational Awareness, and even Space Control missions. Each of these missions requires different types of specific sensors, communications packages, and disseminations requirements. To save time and money, the plug and play capability will leverage existing ground and air capabilities. However, if ground or air sensor technology is used, modifications are required to make them operational in a space environment.

A validated responsive space ICD and CDD would allow the ORS community to define requirements and establish acquisition programs of record. "Funding for traditional acquisition programs can not normally be obtained without first establishing the requirements through formal JCIDS process."<sup>34</sup> In essence, the JCIDS documents

justify the future funding for ORS capabilities. The lack of documentation may lead to significant funding issues. Without approved JCIDS documentation – ORS capabilities will not become acquisition programs of record.

#### Acquisition Process

“Deliberate and rapid acquisition are incompatible processes as currently configured in the Department of Defense, and have different acquisition goals.”<sup>35</sup> This is how the Defense Science Board Task Force, for Fulfillment of Urgent Operational Needs, describes the incompatibility of the two current acquisition processes. The Science Board Task Force recommended a dual acquisition process that allows rapid acquisition to be consistent with the Department of Defense’s 5000 series documentation (see figure 2). Embedded within the Department of Defense’s 5000 series acquisition process is the JCIDS process. Rapid acquisition relies on the use of proven technology that can transition to operational capabilities within the timeline of the commanders needs. If commander’s requests necessitate the development of advanced capabilities, the production of incremental or spiral capabilities will support their request.<sup>36</sup> The concept of operations for responsive space certainly falls within the framework of rapid acquisition.

The process to determine which path a capability will take is dependent on the urgent need of the JFC. The urgent need should state that if left unfulfilled, will seriously endanger personnel and/or pose a major threat to ongoing or imminent operations.<sup>37</sup> With some modifications, this dual acquisition process can be translated to fit a proposed model for responsive space capabilities. A dual path responsive space framework will support development of Tier 1 through Tier 3 capabilities.

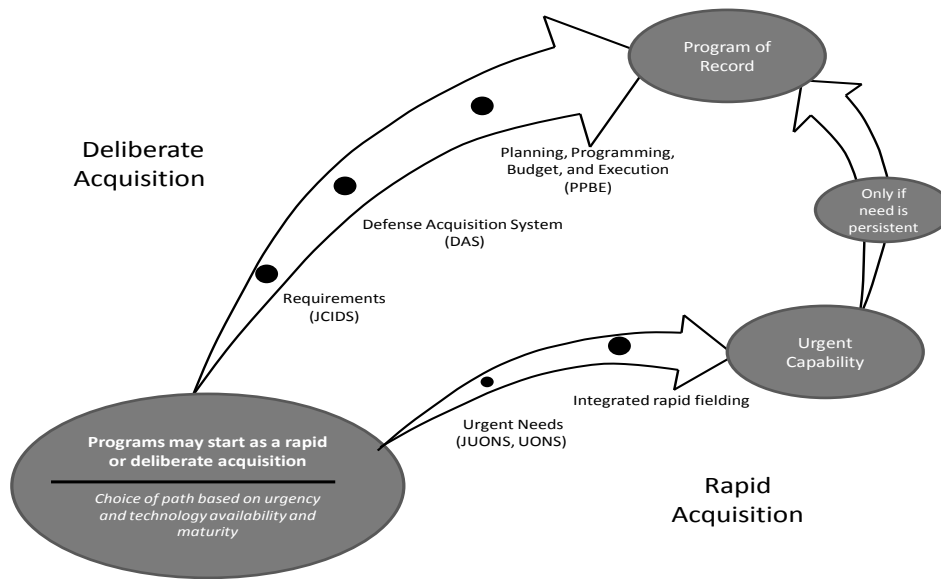


Figure 2: Dual Acquisition Path - Report from the Defense Science Board Task Force on the Fulfillment of Urgent Operational Needs<sup>38</sup>

Tier 1 solutions and limited Tier 2 solutions would follow the rapid employment path to meet required timelines. Tier 1 solutions as defined, would leverage existing capabilities with limited modifications or develop creative ways to use existing system other than their intended use. Tier 2 rapid acquisition solutions would leverage multiple avenues to determine potential solutions and meet the defined timeline of deployment within days or weeks. Limited Tier 2 solutions include capabilities already developed, but are not in the hands of the ORS office. The ORS office will coordinate with commercial space industry, services research laboratories, ongoing military demonstrations and experiments, and/or the U.S. Defense Advanced Research Projects Agency (DARPA) to provide recommended solutions. A current DARPA initiative that would support a future responsive space rapid acquisition urgent need is the Space Enabled Effects for Military Engagement (SeeMe) program. The SeeMe concept is to



develop small low cost satellites that can be rapidly launched to provide tactical units with situational awareness capabilities from space. The satellites have a short temporary life span with communications packages integrated into tactical user's networks. To reduce cost and developmental time the SeeMe satellites would leverage commercial off the shelf components.<sup>39</sup> The ORS office, working with DARPA and the commercial vender would coordinate deployment of a SeeMe capability. It is important to note, determining the acquisition employment path focuses on availability of a capability and would not cause a deviation or change to the current JFC urgent need request process. In addition, the USSTRACTOM and ORS office request and approval process would not have to change for a responsive space dual acquisition path process (see figure 3).

Responsive Space solutions that do not meet the Tier 1 category timeline would follow the deliberate acquisition employment path. The design of the deliberate employment path will meet the timelines for Tier 2 and Tier 3 category solutions. The proposed solution will require using responsive space acquisition program of records to develop plug and play capabilities. Working with the ORS community team, a proposed solution using a standardized bus and payload (senor and communities package) would be presented to the USTRATCOM commander for validation. The final approval would still reside with the executive agent for space. The approval process for deliberate or rapid employment of urgent responsive space need would not change.

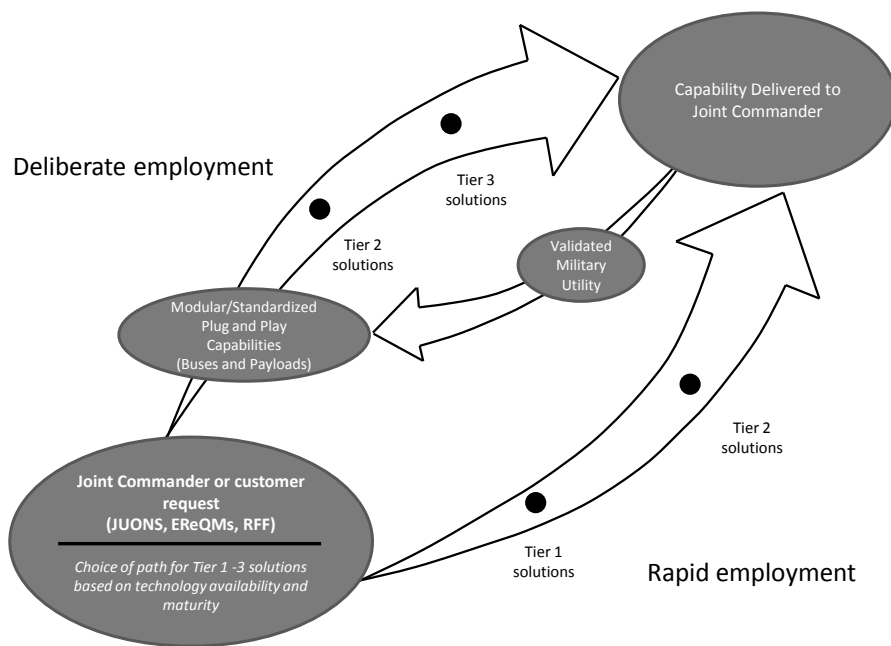


Figure 3: Rapid and Deliberate Employment of Responsive Space Capabilities

The dual path responsive space path does not end with the delivery of a capability to the JFC. The final step is to determine the future military utility of successful capabilities and technologies used by the commanders and integrated them into standardized buses and payloads. The new capabilities would transition into a responsive space acquisitions program of record as potential spiral or incremental solution. The validated technology could also support and be integrated into larger national level space acquisition programs.

Other sources of responsive space capabilities for rapid or deliberate path solutions can come from technology demonstrations and experiments, industry innovations, Service labs, or science and technology organizations. These new

technology initiatives, after validating military utility, can transition to support responsive space solutions. An example of how this transition would support responsive space modular bus and payload concept is United States Army Space and Missile Defense Command / Army Forces Strategic Command (USASMDC/ARSTRAT) Joint Capability Technology Demonstrations (JCTDs) nanosatellite (small satellite) initiative.

Space and Missile Defense Command Nanosatellite Project (SNaP) is a USASMDC/ARSTRAT, Technical Center's JCTD. The mission of SNaP is to launch and operate three communications nanosatellites into low earth orbit to provide United States Southern Command (USSOUTHCOM) with satellite communications and ground sensor exfiltration capability. In conjunction with the SNaP JCTD, USASMDC/ARSTRAT's Future Warfare Center is writing the concept of operations and requirements document to facilitate the transition of the program to an operational capability. The analysis gathered during the JCTD will identify capabilities gaps and support transition to the Joint Capabilities Integration & Development System (JCIDS) process. The analysis is required to support the documentation of an ICD or CDD. The ICD or CDD documents will provide requirements and desired levels of performance to support and integrate with responsive space JCIDS documents.

#### Recommendation

The ORS community needs to develop a concept of operations that includes rapid access to plug and play modular buses and payloads to facilitate delivery of capabilities to JFC's for Tier 2 and Tier 3 solutions. Rapid access should include an inventory of capabilities on the shelf or at a minimum available through partnerships established with commercial vendors. To accomplish the concept of plug and play modular buses and payloads, the ORS office should establish an acquisition program of

record for responsive space. ORS office needs to modify their current operations for program management and validate the requirements with JCID approved documents. In addition to defining responsive space requirements, establishing programs of record may assist in mitigating funding issues that have affected the ORS community in the past year. Great care should be taken to ensure the current benefits and flexibility the ORS office enjoys by not having to follow the JCIDS process is not lost when developing Tier 1 and limited Tier 2 solutions. The ORS community should adopt a dual process acquisition framework similar to that of the Defense Science Board Task Forces. The dual process will allow the ORS community to capture lessons learned and leverage technologies from employed capabilities, Joint Capabilities Technology Demonstrations, commercial space industry, and allies to integrate the capabilities into future systems. The requirements and capabilities can be used to improve current programs of records; improving timelines for employment, reducing costs, and providing the most advance capabilities to the warfighter.

Operationally Responsive Space is defined as: Assured space power focused on timely satisfaction of JFC's needs. To maintain the focus on the Joint Commander needs, the USSTRATCOM request process and the ORS office requirements and solutions generation process has proven to be effective. The ORS community should continue to use the JUONS process as the primary means of capturing JFC's operational needs. The key to success for these processes is the continuous feedback and input afforded to the JFCs or customers. In addition, ORS should maintain a goal of delivering "good enough" capabilities – this philosophy is aligned with the acquisition communities' differentiation between deliberate and rapid acquisition.

## Risks

The USSTRATCOM's definition for satisfying assured timely space based capabilities with the tiered system allows the ORS community to retain its flexibility to operate outside the formal Department of Defense acquisition system. However, without validated JCIDS documents the ORS community will continue to struggle for funding. Funding will be the primary future challenge for developing ORS capabilities as the community attempts to support JFCs and Services with Tier 2 and Tier 3 responsive space solutions. Funding has been an issue for responsive space organizations since 2007 and will become an even bigger challenge over the next few years, as the Department of Defense and Services begin to realize budget constraints and priorities shifts. The end of the war in Iraq combined with the draw down or conclusion of military operations in Afghanistan may provide the primary operational risk to maintaining interest in funding ORS capabilities. Many of today's urgent need statements were justified and validated to support operational and tactical commanders in both theaters. The ORS community will have to rely on CCDRs and Services to articulate the requirement for urgent needs to satisfy gaps to meet emerging threats in a complex operating environment. Reduced funding of current responsive space initiatives, demonstrations, and experiments will increase the military risk of providing commanders with emerging technology, reconstitution of degraded capabilities, and inability to support joint operational urgent needs for Joint and tactical commanders.

The ORS communities' ability to capture lessons learned and integrate successful technologies into the capabilities requirements process, will reduce the operational risk of developing stove piped systems and capabilities that are not responsive to commanders timelines. Capturing successful responsive space

capabilities will enable development of plug and play technology to support future buses, payloads, and launch vehicles. The national space acquisition community can leverage technologies and processes developed by the responsive space community.

### Conclusion

The 2013 Army Strategic Planning Guidance specifically addresses the Army's warfighting functions, weapons and battle systems dependence on space capabilities.<sup>40</sup> Unfortunately, as the dependency for space capabilities grows the availability continues to diminish. To meet these challenges, "The Army must develop and employ mitigation measures while fighting to resort our space enablers."<sup>41</sup> On-demand ORS enables the U.S. military's ability to provide resiliency and redundancy to support commanders at the Joint Task Forces down to the tactical users. The ORS community has proven through experiments, demonstrations, and operational employment of responsive space capabilities that space based assets can fulfill JFC's urgent operational needs. USSTRATCOM, the ORS office, Services, and the community working as a cooperative entity have provided on-demand, cost effective, and tactically relevant capabilities to support the Joint Task Force Commander and tactical users.

### Endnotes

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