CONNECTIVITY AT THE CORE: RESILIENT COMMUNICATIONS ARE CRITICAL TO REALIZING JADC2

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As advancements like artificial intelligence, machine learning and unmanned systems have come to define so many of our daily interactions, the lasting impact of these next-generation technologies is likely to be most pronounced as it relates to contemporary warfare.

Mounting evidence shows that near peer adversaries are also investing in next-generation capabilities, harnessing the power of emerging technologies like low-cost, commercially available unmanned aircraft systems, hypersonics, satellite jamming systems, quantum computing and more. We need not look any further than this past February, when Ukraine confirmed that Russians had infiltrated critical but consumer-grade satellite communications technologies – in contravention of U.S. sanctions – that had previously provided battlefield advantages for Ukraine.

The U.S. finds itself atop the precipice of a new era of warfare, where electromagnetic spectrum superiority will determine who reigns supreme. This realization inspired the Department of Defense (DOD) to introduce and work toward the Joint All-Domain Command & Control (JADC2) concept, a cross-service, collaborative strategy designed to develop, experiment and field novel technologies that enhance multi-domain communications and maintain electromagnetic spectrum superiority.

"Resilient in a degraded environment" – in other words: maintaining communications in remote and austere locations – is one of six JADC2 guiding principles.

However, despite the near-universal acknowledgement throughout the U.S. government and defense industrial base of the criticality of resilient communications, industry remains without a clear definition or standard for the term. This lack of clarity poses significant risk of slowing progress toward realizing JADC2.

Resilient communications are also a key enabler to many operational elements of a modernized fighting force. Everything from intelligence, surveillance and reconnaissance to fires and force protection rely on robust, secure and covert communications systems to ensure communication networks safely deliver data for unified multi-domain operations.

This need for resilient communications will become even more important as the reality of the threats in the Indo-Pacific come into full view. Covering an area that is approximately 52% of the Earth's surface, the Indo-Pacific theater could be the next place where U.S., ally and partner forces need to communicate over extended ranges whilst adversaries seek to deny them access to the spectrum.

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How each service approaches and defines resilient communication varies – as does each service's contributory capabilities to JADC2. Thus, while the Pentagon in the FY 2025 budget requested $1.4B to "transform our command and control warfighting capability," the services must break down the silos in requirement development and acquisition and move from service-specific mindsets to platform-centric discussions to bring to fruition the full potential of these multi-domain solutions.

This is not to suggest that there is a silver bullet to JADC2 establishment or the rollout of resilient communications across the Joint Force. As noted earlier, DOD and the defense industry are learning from current conflicts about how communications networks perform in contested and congested environments.

We're also seeing how commercial solutions compare to purpose-built military technologies. This rapid pace of technology innovation adds to the complexity of developing and deploying next-generation technologies to meet the warfighters' needs of today and prepare them to combat the threats of tomorrow.

Without a common definition or standard of resilient communications among the services, the defense industrial ecosystem is left to embark on a technology development path that is fraught with risk and uncertainty. It's "innovation roulette" – companies are taking calculated risks in hopes of uniformity among customer mission needs and requirements development.

With these challenges in mind, L3Harris has identified the following features as crucial elements of a resilient communications definition:

- Diminishes an enemy's ability to target the user or disrupt their communications;
- Communicates information securely in a contested environment, including communications-jamming threats;
- Meets the latest NSA encryption and decryption standards for Communication Security and Transmission Security;
- Ensures Joint Force interoperability through NSA High Assurance-certified waveforms to enable Combined Joint All-Domain Command & Control (CJADC2); and
- Leverages waveforms conforming to DOD specification or meets licensing parameters through the Joint Tactical Networking Center Tactical Communications Marketplace.

DOD-wide engagement and collaboration will prove essential to JADC2's future. We in industry, along with our counterparts throughout the federal government, share the goal of bringing to life an all-domain communications network and cementing American technological dominance for decades to come. But we need a clear target when it comes to resilient communications.

Define it and we'll see the pace of innovation outpace the speed of the threat.

Nothing could be more important.

Samir "Sam" Mehta is President of Communication Systems at L3Harris Technologies, the Trusted Disruptor in the defense industry. He has nearly 25 years of diversified aerospace and defense experience driving mission-critical solutions that serve the U.S. and our allies.

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