WHITE PAPER

ON

SPACE BASED VULNERABILITIES OF THE EUROPEAN UNION

Lt Col Ben Sorrells,
AWC RSS, Deterrence, Assignment #1,
25 March 2024

Executive Summary:

The European Union (EU) desires to be respected as a regional and world power. Regional and world powers must have the ability to access, secure, and defend the high ground of any would-be battlefield. Today's high ground is, without a doubt, the space domain. Due to political and economic factors plaguing the resilience of its space based critical infrastructure systems, the EU has very real vulnerabilities. The EU family of systems are consumer focused, unfinished, unsecure, untested, and lack the redundancy needed to be resilient in a high-end fight. With an aggressive and highly capable neighbor like Russia, who has shown increasing willingness to take the fight into space, it is imperative that the EU continue down their recent path to alignment of common purpose and vision for space-based securities. As an ever-encouraging partner for strength through unity, the United States (US) is poised to support, partner, and broker successful solutions for the near and long term problem sets. This white paper concludes that if the EU had to engage in space-based warfare with an opponent as equipped as Russia, setting chance aside, the odds are not in their favor. The good news is, they would not need to go it alone.

1. Introduction – EU Vulnerabilities are US Vulnerabilities

Today, the ultimate high ground is the space domain. In this critical domain, the European Union, home to key Allies and Partners of the United States, due to unaligned political and economic factors, have not kept pace with the threats that now hold critical infrastructure at risk. US and EU adversaries now possess the capabilities to disrupt, damage, and destroy critical space-based infrastructure that enables civil and military use of operations enabling data available from satellites that provide weather monitoring, global positioning systems (GPS), environmental surveillance, communications, and banking to name a few. As it stands today, the EU family of systems are consumer focused, unfinished, unsecure, untested, and lack the redundancy needed to be resilient in a high-end fight.[i] With ever globalizing economies and security systems, the US and EU are largely linked to one another. Given a persistent and sustained threat, the vulnerabilities of one quickly dominos to the other. This white paper aims to summarize the EU's current threat assessment, state of readiness, highlight the political and economic factors exacerbating their space-based vulnerabilities, and offer opportunities for the US to engage and support.[ii]

2. Background – Immediate Threats and State of Readiness

The immediate threat to the EU's space-based critical infrastructure originates from Russia. Russia's elite, led by President Vladimir Putin, perceives the ever-expanding North Atlantic Treaty Organization (NATO) membership along its borders as an existential threat to their power centers in the region.[iii] This perception of encirclement led to aggressive investment in technologies that would provide an ability to hold at risk, if not conquer, the ultimate high ground when required.[iv] While the space race with Russia is nothing new, their go-it-alone position, as well as the weaponization of their modern and emerging systems are. Years past, Russia's space programs, as with all nations participating in the domain, were at worst focused on observation and intel collection, but primarily committed to research and development of capabilities that benefited mankind writ large. Fast forward to 2024 and we find a Russia with ground-based satellite disruptors, a successful 2021 anti-satellite missile test, in orbit satellite killers, space based cyber-attacks being levied during its invasion of the Ukraine in 2022, and an aggressive effort to put a nuclear weapon in orbit this year. Assessed alone as a regional power, faced with this threat, the EU is extremely vulnerable.[v] While the EU has not neglected the space domain over the years, its capabilities are largely focused on the enablement of peaceful benefits to civil society, remain split between national and EU commitments, are dependent on others for security features, and lack the resilience of redundancies.[vi] Following the lead of the US Space Force initiative in 2019, European states such as France, and the UK, began posturing independently for space defense. In an overall effort to focus the growth, security, and safety of space related aims of the European Commission, European Parliament, European Space Agency, Member States, and private actors across the EU, the European Union Agency for the Space Programme (EUSPA) was formed in 2021. Supporting EU civil, private, and governmental (military) sectors, EUSPA boasts of programs such as Copernicus, EGNOS (European Geostationary Navigation Overlay Service), Galileo, GOVSATCOM (Governmental Satellite Communications), IRIS2 (Infrastructure for Resilience, Interconnectivity and Security by Satellite), and SSA (Space Situational Awareness) that endeavor to be an integrated family of systems designed to support the EU internal market.[vii] Furthering the EU's readiness effort, post

Russian aggression in 2021 and 2022, the first EU Space Defense Strategy was penned in 2023. While these efforts are valiant and have momentum they are still new, unfinished, unsecure, untested, lack redundancy and complete synchronicity given the ever-present EU challenges of unalignment found in political and economic priorities.[viii]

3. Political Factors Exacerbating Lagging Readiness

Any attempt at explaining the modern-day political factors exacerbating the EU's vulnerabilities in space must begin with a summary of its origin story, developmental pressures, and definition of the current system of systems that is the EU. With roots that even predate World War One, the current form of unity among the nations on the continent began in earnest post World War Two through the leadership of Winston Churchill and the European Movement. Roughly fifty years later, as the Cold War was wrapping up and the Soviet Union was disintegrating, the European Union was finally established in 1992. While a collective sigh of relief was certainly felt on the continent and beyond, centuries old nationalism and desires to uphold sovereign strengths of autonomy continued to permeate policy, security, economy, and societal norms.[ix] On September 11th, 2001, the US was attacked, and it was an inflection point for the world's collective security apparatus. Shadowy, non-state, decentralized terrorist cells now held our security norms and prosperity at risk. As the ensuing War on Terror gripped the globe, the EU, like many other alliances and partnerships experienced a galvanizing affect that shored up differences of the past. Political and security alliances were strengthened and coalitions of the willing found ways around differences for the greater good. While the US and the coalition (many of the EU nations) spent the next 20 years focused on this effort, others watched, learned, sharpened their swords, got richer, and postured to be ready for the next round of great power competition. Not belittling the efforts of the EU, but the US pumped billions into their own military and the coalition effort, and the EU's respective militaries watched readiness wane. Over the years, EU leaders were overly calmed by the strength of the US and its commitment to the EU via NATO's Article 5 and the greater good in general. This calm and passive approach to readiness of its own defense contradicts its long-standing desire to be a respected power in its own right. While an admirable quality that is encouraged by the US, this sentiment also cascades down to the EU's individual member states who adamantly expect sovereignty limits be sown into all accords.[x] To manage these complexities the EU is designed with many layers of representation such as the European Council, The Council of the European Union, European Commission, the European Parliament, the European Court of Justice, the European Court of Auditors, and the European Central Bank that collectively set policy and priorities for all to uphold.[xi] These representatives work diligently to resolve issues as they arise, but as one may expect, many topics are stymied at an impasse. Whether held at an impasse, or politically motivated, many EU leaders, until recently, were held to very minimal defense efforts that seem to be attributed to four narrative; (1) the threat is not credible – current US/NATO coercive pillars work, (2) why waste the resources – an individual national defense effort from our small nation would be ineffective anyway, (3) perceived escalation – why create a problem where one does not exist, (4) for the reasons above, or otherwise, the voting populace simply did not agree with an arms race – no matter the security domain. As a result of such a complex political environment, many programs across the EU atrophied due to low funding or were shelved completely due to lack of appreciation for the need altogether. Space defense was no different.[xii] Since the 1990s the US has attempted to integrate redundancies in a shared transatlantic system to no avail. EU leaders could not agree on system

architecture due to differing interests, doctrine and political views.[xiii] As a reminder, this is not a problem of the past. The United Kingdom voted to leave the EU in 2020 for reasons in part related to political stagnations.[xiv] Presumably, only because of recent Russian aggression, the EU created EUSPA to coral it's various space programs and published its first Space Defense Strategy in 2023. The EU political machine is a behemoth that is highly valued by all. That said, it has proven to be slow to move on many areas of interest related to security of space-based capabilities and it creates a national security concern felt by its Allies and Partners.[xv]

4. Economic Factors Exacerbating Lagging Readiness

There's a common saying that goes, money makes the world go around. While we know that can be scientifically proven to be false, money is absolutely what enables governments and companies to harness the great power of rockets ships to place satellites in orbit, build ground stations that track and disarm in-orbit platforms if required, and provide for the economic needs of those brilliant minds that build and maintain such exquisite machines. The space domain has very high barriers to entry. These barriers begin with the extremely arduous educational requirements to gain access to the field of study, and compounds to include all that is required of manufacturing and maintaining such machines. Everything about a space program is extremely expensive and it is primarily for that reason that the world only has a handful of space fairing nations.[xvi] High barriers to entry aside, if a nation desires to be a great power it must be able to access the ultimate high ground of any would-be battlefield. The EU has not been shy about investing in the space domain. It has consistently ranked in the top five of governments that invest in space-based programs. Statista.com reports that in 2022 the US led with approximately $62B, followed by China at $12B, then the EU contribution combined for a total of $8.4B to place it in third. The roster goes on to place Japan in fourth with $5B, and Russia in fifth at $3.5B.[xvii] As evident here, the EU writ large is economically focused on the space domain. That said, the economic factors exacerbating lagging readiness are effectively found to fall in the following four categories; (1) investments are split between competing programs such a ESA, EUSPA, and individual member state programs, etc., (2) taxes in the EU severely hinder the home based space market and investors out of the EU buy in, (3) space launch programs need to be rebuilt after Russia canceled support during the war in Ukraine, and (4) complex governance of proprietary sharing and sovereignty issues create extremely expensive and complex solutions as companies search for agreeable terms for everyone. Although EU leaders are aware of the issues related to allocation of funds, keeping the market open, focus and competitive, their initiatives have only recently been developed and will take a few years minimum to yield substantial results.[xviii]

5. Opportunities For the United States to Support

The US has many reasons to support and encourage the success of the EU. The US has a shared origin story with many of the EU's member nations. The relationship has been battle-tested, bruised, and renewed over and over throughout the years. In the realm of space-based capabilities, lack of a good faith reason to support the EU has never been an issue. The US, in fact, has reached out across the Atlantic for more than 30 years to try and build a shared space-based architecture supportive to both our civilian capabilities and military security initiatives. Since the early 2000s, the US and ESA have endeavored to collaborate on six pillars; (1) Space

Science, (2) Human spaceflight, (3) Satellite navigation, (4) Meteorology, (5) Earth Science and Observation, and (6) Space exploration.[xix] While many successes can be found throughout these partnerships, any effort to build a resilient transatlantic family of systems has thus far been stifled by the political and economic challenges presented. That said, given the current security environment the EU finds itself in, renewed momentum to synchronize a family of redundant systems does exist. The US is poised to support hardening of the EUs critical space based infrastructure via three lines of effort; (1) Build interoperability among emerging EU space security agencies with the newly minted US Space Force European Command,[xx] and the North Atlantic Treaty (NATO) Command and Control (C2) enterprise,[xxi] (2) Leverage the current security environment to broker agreeable systems architecture among US and EU transatlantic space programs, (3) Leverage the current security environment to broker agreeable economic alignment across the EU nations that bolsters focus and multi-year budget assurances too investors in Europe.

6. Conclusion

While nuclear powers continue to saber rattle about their respective abilities to destroy the world if the need should arise, the reality is that current world powers do desire to survive while competing for a most strategic advantage. Short of a cataclysmic dooms' day series of events, deterrence of escalated war between global powers remains to this day a game of jockeying for dominance of the high ground. Space, without question, is that high ground.[xxii] This white paper has summarized the EU's current space-based vulnerabilities, summarized their immediate threat and state of readiness, highlighted the political and economic factors exacerbating these vulnerabilities, and offered opportunities for the US to engage and support. In conclusion, if the EU had to engage in space-based warfare with an opponent as equipped as Russia, setting chance and the unknown aside, the odds are not in their favor. The good news is, they would not need to go it alone.

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