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MAY - 3 2018

MEMORANDUM FOR SECRETARIES OF THE MILITARY DEPARTMENTS
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SUBJECT: DoD Principles on Mission Effectiveness and Spectrum Efficiency

The Department of Defense (DoD) is working with U.S. policymakers to consider electromagnetic spectrum (EMS) access broadly and not restrict the development of possible solutions to address the Department's challenges or any one group of spectrum users. Various National Telecommunications and Information Administration (NTIA) spectrum incentives and efficiency efforts are under way, under its senior spectrum Policy and Plans Steering Group (PPSG). Legislative efforts have also sought to impose statutory requirements in this area. Incentive efforts are typically based on incorrect assumptions that agencies lack incentives for efficient use of the EMS. This has prompted a need to establish Department policy guidance, which will be based on overarching spectrum efficiency principles that set an accurate baseline of drivers for national security by emphasizing the critical role of mission effectiveness (See Attachment). Going forward, these principles will serve as the fundamental basis for DoD engagement with U.S. policymakers and for internal Department policy considerations on the subject of spectrum incentives and efficiency.

Assured access to the electromagnetic spectrum continues to be critical to almost every DoD operation. Our warfighters increasingly must depend on bandwidth-intensive capabilities requiring access to a wide range of spectrum to perform diverse missions that are mobile and global in scope. The portions of the EMS needed to support these capabilities depend on many factors, including physical properties, international agreements, and domestic regulatory and governance rules. Conversely, the commercial industry's demand for access to the same ranges

of the EMS continue to increase. As such, meeting the growing demand for access is an issue of critical importance for both economic growth and national security.

Striking the right balance continues to be a challenge for our nation's spectrum policymakers. The challenge is exacerbated as DoD's and other federal users' access to the EMS continues to decrease due to ongoing regulatory and legislative efforts to reallocate more federal spectrum for commercial broadband. Reallocation priorities lead to misperceptions that reducing Federal spectrum access is a means of increasing "spectrum efficiency." The two U.S. spectrum regulators, the NTIA and the Federal Communications Commission (FCC), have not imposed a one-size-fits-all definition of spectrum efficiency. This is due to the impracticality of applying one for different types of users or different types of efficiencies (i.e., operational, economic and technical). This is especially true for federal users who execute a wide range of missions using an array of divergent spectrum-dependent capabilities across the EMS. Nonetheless, spectrum efficiency has long been a topic of interest for U.S. policymakers. Recent interest by Congress, FCC and the Executive Branch has reignited a focus on federal spectrum efficiency.

The complex EMS environment and evolving threats that our nation's warfighters face already compel the Department to constantly consider increased efficiencies. Mission effectiveness is the overriding driver for DoD to structure spectrum-dependent capacities and operations for efficiency, agility, lethality and flexibility. This is true today more than ever as DoD remains focused on successful execution of joint EMS operations (JEMSO), which includes all activities in military operations to plan and execute joint or multinational operations in order to control the electromagnetic operational environment.

The 2013 DoD Electromagnetic Spectrum Strategy proactively addressed spectrum efficiency and effectiveness. DoD is refining its strategy in keeping with the evolving operational realities highlighted in the principles. Ensuring that efficiency objectives further advance operational needs is critical. This is particularly the case today since, as part of preserving "peace through strength," spectrum-based capabilities will fuel solutions for many of the tenets in the National Security Strategy (NSS), which emphasizes the need for modernization: "Ensuring that the U.S. military can defeat our adversaries requires weapon systems that clearly overmatch theirs in lethality." As the attached spectrum efficiency principles state, "Lethality and the ability to seize, retain, and exploit the initiative cannot be traded away for spectrum efficiency."

In light of NTIA's PPSG efforts to address spectrum efficiency as part of multi-year initiatives, DoD created the Spectrum Incentives Working Group to constructively respond to these proposals on Federal spectrum incentives. The intent is to influence balanced solutions for increasing the efficiency and effectiveness of both federal and non-federal spectrum use, including through advanced technologies, evolved policy approaches and refined spectrum sharing techniques to increase access to the EMS for all users.

The DoD Chief Information Officer point of contact for this matter is Mr. Frederick D. Moorefield, Director Spectrum Policy & Internal Engagement, and can be reached at frederick.d.moorefield.civ@mail.mil or 703-545-1000.


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Acting

Attachment

DoD Principles on Mission Effectiveness and Spectrum Efficiency

- 1) **The National Security objective is paramount to DoD's mission effectiveness and drives the military to deploy any and all capability, including those that rely on spectrum, with the most judicious employment and distribution possible:** Spectrum effectiveness and efficiency are integral to fulfilling mission. Efficiency depends on the mission requirement, which is not determined by propagation characteristics or spectral occupancy alone.
- 2) **The coordinated impact of spectrum-generated military capability, delivered with overwhelming effectiveness, and synchronized for time and place, is essential for DoD mission success:** A one-size-fits-all definition of spectrum efficiency, especially based on monetary profit vice mission effectiveness, is unacceptable for military and other federal users that must meet a wide-range of mission objectives using disparate spectrum-dependent capabilities that operate in different parts of the electromagnetic spectrum. As such, substituting access from one spectrum band to another is typically not feasible or sufficient from a physics and/or mission perspective.
- 3) **The measured employment of military capability to achieve mission effectiveness to advance national security will affect the effective and efficient use of spectrum:** Factors include but are not limited to operational concept, range, payload, physics, cost, schedule, performance, recovery and risks.
- 4) **Lethality and the ability to seize, retain, and exploit the initiative cannot be traded away for spectrum efficiency:** DoD action is focused on a clearly defined, decisive and attainable objective. Offensive action is the most effective way to attain a clearly defined common objective, maintain freedom of action, and achieve decisive results. Meeting the mission requirements is the critical driver that determines how DoD establishes operational trade-offs (e.g., size, weight, power; targeting ability; resources).
- 5) **Military access to spectrum is a global requirement, which is growing, since the adversaries occupy this operational space:** DoD's allies and adversaries are both expanding their presence and increasing their military operational capability. DoD is continually challenged to counter innovative capabilities and evolving threats that are increasingly complex. The Department's demand is to do more across the spectrum than it has access to today, including spectrum used for and occupied by commercial technologies and services.
- 6) **Reduced spectrum access will reduce DoD's mission effectiveness and efficiency with potentially adverse operational implications:** Warfighters will continue to require freedom of action through increasing and diverse spectrum access to counter the rapidly evolving and highly diversified threat. Constraining access to narrower slices of spectrum denies freedom of maneuver for multi-role military capabilities and presents actions that are more predictable, easier to identify, and increasingly vulnerable to attack.

- 7) **Any new equipment developed and procured must fit into existing infrastructure and not impede the ability to deliver combat capability at the decisive place and time:** DoD's efficient and effective use of spectrum has to account for interoperability between a baseline of older, legacy systems and newer advanced technologies.
- 8) **Spectrum allocation policies and regulations must provide a clear path for flexible military spectrum access to support evolving operational requirements and enable technology innovation:** Spectrum policy makers, including regulators, play a critical role in ensuring spectrum access flexibility to enable maneuver space to combat the current threat and accommodate future bandwidth growth requirements. Spectrum policy and reallocation considerations solely based on a commercial opportunity cost or spectrum use intensity metric focused on monetary profit are inapplicable for military spectrum requirements based on specific mission mandates.
- 9) **For DoD missions, clarity of objective, planning with minimal to no encumbrance, as well as timely and effective execution of capability often translates to spectrum efficiency to ensure mission effectiveness:** DoD continues to proactively engage in a wide array of efforts to improve mission effectiveness, which have direct implications on spectrum efficiency.