

**Before the  
NATIONAL TELECOMMUNICATIONS AND INFORMATION  
ADMINISTRATION U.S. DEPARTMENT OF COMMERCE  
Washington, DC 20230**

In the Matter of )  
 )  
United States Spectrum Management ) Docket No. 040127027-4027-01  
Policy for the 21<sup>st</sup> Century )

**COMMENTS OF LOCKHEED MARTIN CORPORATION**

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**COMMENTS OF LOCKHEED MARTIN CORPORATION**

Lockheed Martin Corporation (“Lockheed Martin”) hereby responds to the National Telecommunications and Information Administration’s (“NTIA”) Notice of Inquiry (“*NOI*”) regarding U.S. spectrum management policy for the 21<sup>st</sup> Century.<sup>1</sup>

**I. INTRODUCTION AND BACKGROUND**

On May 29, 2003, President George W. Bush issued an Executive Memorandum announcing the Administration’s commitment to develop and implement a comprehensive U.S. spectrum management policy for the 21<sup>st</sup> Century.<sup>2</sup> The President directed the Secretary of Commerce to develop recommendations, and Lockheed Martin commends the Department of Commerce, and NTIA in particular, for working to fulfill the President’s commitment to a modernized U.S. Spectrum Policy. This *NOI* is an important step in this process. The *NOI* brings to the fore a wide range of issues that affect all users and beneficiaries of spectrum-based technologies – whether Federal or

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<sup>1</sup> See *United States Spectrum Management Policy for the 21<sup>st</sup> Century*, Notice of Inquiry, Docket No. 040127027-4027-01, 69 Fed. Reg. 4925 (Feb. 2, 2004).

<sup>2</sup> See *Spectrum Policy for the 21<sup>st</sup> Century*, Memorandum for the Heads of Executive Departments and Agencies, 69 Fed. Reg. 1568 (Jan. 9, 2004) (“Executive Memorandum”).

non-Federal, civilian or military, commercial or non-commercial, terrestrial or satellite, domestic or international.

Lockheed Martin is participating in this proceeding as a global enterprise principally engaged in the research, design, development, manufacture and integration of advanced-technology systems, products and services for both commercial and government customers worldwide. The corporation has extensive experience in working with NTIA and Government agencies on spectrum matters related to civilian and military Government systems. Lockheed Martin has also worked extensively with NTIA and the Interdepartment Radio Advisory Committee (“IRAC”) process to obtain authorizations for devices and systems that require U.S. Government coordination. In addition, Lockheed Martin holds approximately 400 licenses and authorizations issued by the Federal Communications Commission (“FCC”), including: (1) experimental licenses to support research and development of advanced technology products and services; (2) industrial private land mobile authorizations that enable Lockheed Martin to self-provide critical internal communications on a secure, reliable basis in support of manufacturing plants and other facilities; (3) numerous earth station authorizations to perform telemetry, testing and communications functions and in-orbit transfers, and to provide satellite communications services to both civil and military customers worldwide; and (4) a space station authorization for the MARISAT satellite system. Lockheed Martin also has pending before the FCC a satellite application to provide a commercial space-based radionavigation service in support of the Federal Aviation Administration’s Wide Area Augmentation System (“WAAS”) Geostationary Command and Control Segment (“GCCS”).

Access to spectrum, including globally coordinated spectrum, whether it be in the UHF, VHF, C-band, X-band, Ku-band, S-band, L-band, Ka-band or higher, is an integral and necessary pre-requisite to many of Lockheed Martin's products, systems and services – whether they are intended for Government or non-Government uses.

## **II. THE GOVERNMENT CAN TAKE MEANINGFUL STEPS TO FACILITATE A MODERNIZED AND IMPROVED U.S. SPECTRUM MANAGEMENT SYSTEM**

### **A. Spectrum Management Organization**

The *NOI* notes the bifurcated spectrum management system currently in place in the United States and seeks comment on whether the nation would be better served by a centralized organization responsible for both Government and non-Government spectrum matters.<sup>3</sup> Lockheed Martin does not propose any structural recommendations with respect to the U.S. Government's organization of spectrum management activities. To the extent NTIA is examining alternative spectrum management approaches, however, one model to consider is a bifurcated structure in which a single agency would be responsible for U.S. spectrum allocation – accounting for both Government and non-Government spectrum needs – and a separate organization(s) would be responsible for spectrum assignment duties. A unified allocation process can readily account for the needs and opportunities of both Federal and non-Federal users, while a bifurcated organizational structure based upon spectrum management function – rather than spectrum user – could be a more efficient and rational approach, as described below.

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<sup>3</sup> See *NOI*, 69 Fed. Reg. at 4924.

In its purest form, the allocation process sets spectrum priorities and identifies categories of services within specific spectrum bands. Today, however, the licensing process – a distinct downstream component of spectrum management – can affect spectrum allocation decisions. Licensing schemes, auction revenues, and distributional effects hold the potential to impact allocation decisions. Given the critical importance of spectrum-based services to the nation’s economic and security interests, the Government could establish an agency in the Executive Office of the President solely responsible for U.S. spectrum allocation decisions, leaving spectrum assignment duties in the hands of the FCC and NTIA.

Putting aside such far-reaching modifications, Lockheed Martin urges NTIA to recommend adoption of more specific and immediate ways to improve the U.S. Government’s existing approach to spectrum management. In particular, Lockheed Martin suggests that NTIA – through its role as the leader of the IRAC – place additional emphasis on managing the interplay between Government and non-Government spectrum interests. Lockheed Martin identifies below two specific examples – one each from the commercial and Government user perspective. First, NTIA, working with the FCC, should strive to make the IRAC-FCC license coordination processes as transparent as possible. In addition, NTIA should ensure that the Office of Spectrum Management and the IRAC have the clear jurisdiction to protect users in exclusive Government spectrum from harmful out-of-band-emissions.

With regard to the commercial example, Lockheed Martin notes that approximately 63 percent of the spectrum from 0 to 3 GHz is subject to a shared

Government/non-Government allocation, which NTIA and the FCC jointly oversee.<sup>4</sup> If a commercial entity seeks authority to use shared Government/Non-Government spectrum, the FCC forwards the application to the IRAC for review. If the IRAC review process identifies interference concerns, IRAC may send questions back to the FCC – but notice of this correspondence is not a matter of public record and the commercial applicant has no way of tracking the status of its application, let alone the underlying concerns expressed in the IRAC process. At times, it is difficult to determine where an application is between the FCC and NTIA, through no fault of either agency’s staff – simply the process is not designed to afford transparency to many even within the respective agencies. NTIA, in conjunction with the FCC, should seek ways to enhance the IRAC-FCC coordination process to provide transparency to the applicants and to improve efficiencies in the licensing/coordination process. For example, the IRAC and the FCC could agree to enable applicants to track via the FCC website where an application is, whether questions have been sent to the FCC by the IRAC, whether those questions remain open and pending, and whether they have been communicated to the applicant or responded to. This will allow the applicant to shoulder some of the burden for addressing technical/policy issues that may arise in using shared spectrum. NTIA is currently establishing a web-based mechanism to facilitate the coordination of Federal and non-Federal operations in the 70, 80, 90 GHz bands; as experience is gained, this approach could be extended to more intensely utilized spectrum bands.<sup>5</sup>

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<sup>4</sup> See NTIA, *Myths vs. Reality*, available at <http://www.ntia.doc.gov/ntiahome/myths.html>.

<sup>5</sup> NTIA initiated this program consistent with an agreement made as part of a recent FCC proceeding. See *Allocations and Service Rules for the 71-76 GHz, 81-86 GHz and 92-95 GHz Bands, Report and Order*, WT Docket No. 02-146 (rel. Nov. 4, 2003). The program

Separately, the Administration should clarify the appropriate structure for regulatory review of out-of-band-emissions that have the potential to affect Government systems operating in exclusive Government spectrum. Today, questions remain regarding which Governmental entity has jurisdiction to assess whether and to what extent a commercial applicant's out-of-band emissions would be harmful to users of exclusive Government spectrum. Given the mission critical nature of many uses that operate in exclusive Government spectrum, Lockheed Martin believes that the national interest is best served by ensuring that the Office of Spectrum Management and the IRAC have the absolute jurisdiction over determinations of potential interference from out-of-band interference into exclusive Federal government use spectrum.

## **B. Spectrum Planning**

The *NOI* seeks comment on the nature and scope of U.S. spectrum planning activities.<sup>6</sup> As a threshold matter, U.S. Government spectrum planning must: (i) account for and be responsive to the changing needs of Federal users; and (ii) keep pace with the innovation and dynamic change occurring in spectrum-based technologies. Simply put, effective spectrum planning must go far beyond the allocation planning function. It must seek out developments in new technology and understand their implications; it must consider users' new and ongoing spectrum needs; and ideally, it must lay the foundation for further innovation.

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is intended to allow non-Government users to use a website to determine whether they have any potential conflict with Government users. The website will keep non-Government applicants apprised of the status of their applications, including whether the application has been submitted to the IRAC, whether the IRAC has completed its review, and the result. *See* <<http://ntiacsd.ntia.doc.gov/webcoord/status.cfm>>.

<sup>6</sup> *See NOI*, 69 Fed. Reg. at 4925.

To accomplish these goals, Lockheed Martin urges NTIA to expand ways for Federal users to participate in the planning process. They are on the front lines of operations and offer an unrivaled resource for assessing the spectrum needs of the future devices, systems and platforms that the U.S. Government will deploy. Further, they have the complicated and lengthy, but critical, mission responsibility of meshing those needs into the Federal procurement processes.

To spur new means to address Federal user needs, Lockheed Martin proposes that the Government identify specific “spectrum test beds” that would allow Federal users to experiment with innovative new spectrum-based technologies. This approach would foster research and development dedicated to serving the needs of Government with innovative solutions.

### **C. Exclusive Government Frequency Allocations and Interoperability**

The *NOI* seeks comment on the merits of retaining exclusive allocations for Government and non-Government uses.<sup>7</sup> Lockheed Martin firmly supports the existing allocation arrangement, especially in connection with exclusive Government spectrum. As network-centric warfare capabilities and information superiority have emerged as key to U.S. successes, it goes without saying that spectrum-dependent technology is an element of our national defense and homeland security. The mission critical nature of many Federal spectrum-dependent operations demands that the U.S. Government have exclusive control in those frequency bands to guarantee effective access for such systems and services.

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<sup>7</sup> *See id.* at 4924.

Lockheed Martin nevertheless believes the Government should continue its willingness to support sharing possibilities *where appropriate*. Public safety interoperability, for example, is a prime example of where sharing opportunities could prove especially useful. The FCC recently gave its approval to a unique partnership among Federal, state, and local governments in Alaska to create a statewide public safety VHF trunking system using both Government and non-Government spectrum.<sup>8</sup> The system will provide for enhanced interoperability and improved public safety responsiveness by all participating agencies. The Government should continue to support this type of voluntary partnering and should consider whether other spectrum bands, including the 700 MHz public safety band, constitute appropriate frequencies for similar Government/non-Government partnerships.

The Government should consider additional ways to support agencies interested in pursuing such *voluntary* partnerships to improve interoperable communications, thus enhancing spectrum use. Federal agencies, for example, that manage particular channels and/or frequencies for their own intermittent, but necessary, uses may wish to consider the potential of leasing arrangements that would expand spectrum use opportunities while ensuring that the agency retains access to the spectrum on a preemptible basis.

#### **D. U.S. Tables of Frequency Allocations**

The *NOI* observes that NTIA and the FCC publish versions of the U.S. Table of Frequency Allocations that “differ in several ways.”<sup>9</sup> The conflicting tables create

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<sup>8</sup> See State of Alaska, *Memorandum Opinion and Order*, DA 03-2612 (rel. Aug. 7, 2003).

<sup>9</sup> *NOI*, 69 Fed. Reg. at 4924.

unnecessary hardships for manufacturers and commercial users seeking to develop systems in accord with U.S. spectrum allocations. While the *NOI* asks whether the Government should “replac[e] the existing tables with a single national policy document,”<sup>10</sup> Lockheed Martin respectfully submits that a more practical and effective solution would be to produce a harmonized allocation table, not a new policy document.

#### **E. Frequency Coordination**

The *NOI* also seeks comment on whether the FCC’s frequency coordination management tool should be expanded to other bands and services.<sup>11</sup> Private bodies such as frequency coordinators have proven enormously useful in facilitating the FCC’s administrative process under a mounting workload. The Government, for example, should consider fostering frequency coordinators where new operators enter a band and are responsible for sharing spectrum or relocating hundreds or thousands of licensed entities. Lockheed Martin, however, is reluctant to suggest that frequency coordinators would be effective in the satellite-to-satellite coordination context. Given the relatively small number of satellite players and the history of successful intersystem coordination in the industry, the imposition of a frequency coordinator is unwarranted and would add an unnecessary layer to the coordination process.

### **III. THE UNITED STATES MUST CONTINUE TO SERVE AN ACTIVE ROLE IN INTERNATIONAL SPECTRUM POLICY FORA**

The *NOI* notes the Department of State’s role as lead U.S. negotiator in bilateral and multilateral discussions regarding numerous communications policy issues including

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<sup>10</sup> *Id.*

<sup>11</sup> *Id.* at 4924-25.

spectrum allocations. It seeks comment on improving the U.S. national process from preparation through implementation.<sup>12</sup>

By way of background, in recent years a strong and stable U.S. presence in the international spectrum arena has become increasingly important as regional bodies from across the world have demonstrated greater interest in spectrum matters. The Government must be vigilant in ensuring that the interests of the U.S. Government, U.S. industry, U.S. consumers, and U.S. competitors are served – and not adversely affected – in the international spectrum fora.

The Department of State’s Office of International Communication and Information Policy (“CIP”) serves a critical function in U.S. negotiations on spectrum issues, providing continuity of relationships with foreign governments in bilateral, regional and multilateral arenas. Department of State leadership in these intergovernmental discussions also ensures consistency with U.S. foreign policy in the management of those governmental relationships. Finally, the Department of State’s CIP, through its own technical and policy staff, plays an essential arbiter role that no Government agency with parochial spectrum interests, including NTIA and the FCC, could.

In addition, as a general matter domestic U.S. spectrum management and related policy decisions cannot be made in a vacuum; rather, such decisions need to take into account the international table of frequency allocations in order to maintain existing and obtain, where possible, new harmonized international spectrum allocations. Moreover,

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<sup>12</sup> *Id.* at 4925.

the U.S. Government needs to take into account the need for some consistency in its own approach to specific spectrum bands, and avoid the missteps of the past – obtaining a global spectrum allocation at an ITU World Radiocommunication Conference (“WRC”) for one service, and then returning home and reallocating a portion that same spectrum domestically for another service – before even the next WRC. While offering a range of benefits for all spectrum-based service providers and manufacturers, international spectrum harmonization is far more than a benefit to the satellite industry. It is critical to the overall viability of the international and global satellite industry, as well as to its unique strengths of providing universal global access to connectivity on a distance insensitive basis.

Lockheed Martin also wishes to emphasize the importance of timely domestic implementation of WRC spectrum allocation decisions. As recognized by this Administration and the FCC, timely implementation is of critical importance to all of the affected interests – manufacturers and service providers, Government and commercial users alike. The satellite industry may be particularly affected by this because of the intersection between international treaty obligations to which U.S. satellite companies (and Government operators) are subject (*i.e.*, to make an ITU filing to reserve a place in the “priority queue”) and the FCC’s new space station licensing rules which prohibit the acceptance of a space station application (and the associated ITU filing) until there is a domestic allocation in place. Regulatory delays in even initiating relevant domestic implementation proceedings represent significant opportunity costs for the U.S. satellite industry vis-à-vis competitors who may file first at the ITU, and delay the opportunity for rollout of new advanced services and technology to consumers. In addition, timely

implementation of allocation decisions of primary interest to the Government is also significant. Both Federal agencies and industry spend significant human and financial resources to obtain particular results at the WRC; ensuring timely implementation of those results is only appropriate.

Lockheed Martin commends both NTIA and the FCC for the timely WRC-03 follow-up implementation plan – an important change from the significant delay (*i.e.*, years) that has historically occurred between prior WRCs’ adoption of international spectrum allocations and Government implementation of same. Lockheed Martin suggests that the Government adopt a policy to ensure that last year’s timely implementation plan becomes the guidance for the future if not the standard. Specifically, the Government should establish that proceedings to implement WRC spectrum allocation decisions are initiated within four months of the close of each WRC and are concluded generally within a year.

#### **IV. THE GOVERNMENT MUST TAKE INTO ACCOUNT PUBLIC BENEFITS IN ANY CONSIDERATION OF “EFFICIENT USE OF SPECTRUM”**

The *NOI* solicits comment on the appropriate definition of efficient use of spectrum and seeks to identify incentives for more efficient and beneficial use of spectrum.<sup>13</sup> The *NOI* identifies three ways to measure efficiency in spectrum use – technical efficiency (*e.g.*, bandwidth, frequency reuse, geographic coverage), economic efficiency (*e.g.*, revenue, profit, added value) and functional efficiency (*e.g.*, reliability,

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<sup>13</sup> *Id.*

quality, ease of use).<sup>14</sup> Lockheed Martin respectfully submits that Government spectrum use cannot easily be translated into traditional metrics for spectrum use.

Spectrum-dependant Government operations are vital to many of our national interests – serving national security, safeguarding property and life, furthering crime prevention, and supporting national and international transportation (by land, sea, air, and space), to name a few. Supporting these national interests result in “public benefits”; these benefits are not quantifiable as consumer benefits, such as willingness to pay, or technical efficiency, such as a bits-per-hertz-per-second value.

Instead, the Government must consider the *effectiveness* of Government operations – taking into account the purpose they serve and the necessary reliability. For example, the Government uses radar systems for national security purposes – to detect, for example, incoming missiles and ensure countermeasures. These operations are, by their nature, passive and under traditional metrics might not be deemed “efficient.” They, nonetheless, serve critical U.S. national security interests. While it is appropriate to confirm periodically the justification for Government spectrum use, the benefits derived are often qualitative in nature and do not lend themselves to quantitative metrics.

The *NOI* also seeks comment on the imposition of spectrum fees “to reflect the opportunity cost of the spectrum resource.”<sup>15</sup> Government should, of course, endeavor to use technology that is technically efficient – and Lockheed Martin is working with Government agencies to do just that. But Lockheed Martin does not believe that

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<sup>14</sup> *Id.*

<sup>15</sup> *Id.*

spectrum fees would create appropriate incentives for more beneficial Government spectrum use. Spectrum fees would only result in a circular budgetary approach – with agencies seeking Government appropriations to then submit to the Treasury – and would only serve to constrain spectrum-dependant Government operations *with no real correlation to purpose or worthiness of spectrum-based operations*. Further, in response to the *NOI's* questions regarding OMB efforts to value Government spectrum, Lockheed Martin is concerned that such actions will serve to restrict Government systems absent any assessment of the public benefits derived from the these operations.

In addition, Lockheed Martin notes for this proceeding a very key congressional mandate that should be recognized for its meaningful contribution to the health and success of the U.S. satellite industry. In March 2000, Congress adopted the Open-Market Reorganization for the Betterment of International Telecommunications Act of 2000 (the “ORBIT Act”) and exempted satellite spectrum for international and global satellite systems from the FCC's auction authority for specific, sound public policy reasons which are even more valid today.<sup>16</sup>

The legislative history of this provision makes clear that Congress was concerned that if the FCC auctioned international spectrum and associated orbit slots, it would “open[] the door and allow[] countries around the globe to conduct such auctions” resulting in “a dramatic, negative impact upon the development of global competition in

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<sup>16</sup> Section 647 of the ORBIT Act provides, “Notwithstanding any other provision of law, the Commission shall not have the authority to assign by competitive bidding orbital location or spectrum used for the provision of international or global satellite communications services.” ORBIT Act, § 647, 114 Stat. at 57 (*codified at* 47 U.S.C. § 765(f)).

the industry.”<sup>17</sup> The FCC also concurred with this assessment, concluding that auctioning spectrum for satellite services “opens the possibility of a hold up by some later country that is the vital final piece, [which] sets auction terms that are unfair and capricious and thus lead[] to distortions in the marketplace.”<sup>18</sup> The fact remains that the domestic and international financial and business repercussions and uncertainties associated with global and international satellite spectrum auctions could undermine the leadership of the United States in the satellite field. Moreover, the current approach has enabled the development and deployment of an overall successful, state of the art satellite industry. Lockheed Martin believes that subjecting such enterprises to the uncertainties of an auction dynamic – whether sequential or global – could seriously jeopardize continued commercial research and development in the higher spectrum bands, as well as curtail current plans for investment in and expansion of such satellite systems.

For many of the same public policy reasons, the Administration should be cautious about the ramifications of any agency proposal to impose on international or global satellite systems any spectrum usage fees that are not attributable to direct administrative costs.<sup>19</sup> As a spectrum management tool, spectrum fees pose significant risks without any obvious countervailing public policy benefits.

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<sup>17</sup> See Hearings on Satellites and the Telecommunications Act Before the Senate Commerce, Science and Transportation Subcomm. on Communications, 105<sup>th</sup> Cong. (Jul. 30, 1997) (Statement of Chairman Conrad Burns), *referenced in S. 376 Report*, S. Rep. No. 106-100 (Jun. 30, 1999).

<sup>18</sup> *Id.* (Statement of Peter Cowhey, Chief, FCC International Bureau).

<sup>19</sup> Even fees for administrative costs carry some real global risks for the U.S. satellite industry; to wit, the ITU is already seeking ways to impose higher and higher fees on commercial and Federal satellite systems. Due to its worldwide leadership and success,

**V. A RATIONAL SPECTRUM MANAGEMENT PROCESS MUST RECOGNIZE THE RIGHTS AND REASONABLE EXPECTATIONS OF EXISTING USERS**

The President's Executive Memorandum directed the Secretary of Commerce to identify recommendations regarding, *inter alia*, greater predictability in the spectrum management process as it relates to existing users.<sup>20</sup> Lockheed Martin urges NTIA to offer firm recommendations in the areas of interference protection and existing users' authorized rights.

As innovation in spectrum-based technologies continues to expand and demand for spectrum-based services continues to grow, the Government naturally is looking at ways to introduce new services or users in currently authorized spectrum. The Government, however, must maintain constant vigilance to ensure that the availability and reliability of existing licensed services will not be diminished due to increases in the noise floor and the diversion of limited resources to interference mitigation.

For example, the FCC has initiated a proceeding to consider the "interference temperature" concept, a proposal that would permit unlicensed operations below a certain interference level in spectrum previously awarded on an exclusive use basis. Rather than ensuring authorized users' rights to make the highest and best use of the spectrum, sharing concepts like the interference temperature proposal threaten to degrade the performance of currently deployed systems and may in fact make future systems more

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the U.S. satellite industry would bear the disproportionate burden of ITU cost recovery fees, potentially impacting plans for further investment and development. Lockheed Martin urges the Administration to take the necessary steps to ensure that the U.S. satellite industry is not forced to subsidize other ITU activities at the upcoming ITU Council meeting in June 2004.

<sup>20</sup> See Executive Memorandum, Sec. 2(b).

costly, or inhibit the deployment of advances in technologies by incumbent services in those bands subject to an interference temperature.

Lockheed Martin urges NTIA to adopt a policy that new entrants seeking to share spectrum with existing providers authorized on an exclusive use or primary basis bear the burden of demonstrating that their operations would not cause harmful interference. To that end, the Government should consider a program of private interference labs to assist with state-of-the-art modeling and simulation capabilities to test the impact of proposed operations on existing providers. These private labs, like the FCC's private equipment certification bodies, would be required to operate in accordance with standards established by the Government.

## **VI. CONCLUSION**

Lockheed Martin again applauds NTIA and the other Federal agencies for their efforts to modernize and improve the U.S. Spectrum Management Policy for the 21<sup>st</sup> Century. Lockheed Martin urges NTIA to adopt as recommendations the proposals identified herein.

Respectfully submitted,

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