Before the
United States Department of Commerce
National Telecommunications and Information Administration
Washington, D.C. 20230

In Re:	
United States Spectrum Management Policy For the 21st Century	**Docket No. 040127027402701**

Comments of Wayne Longman

The Administration (NTIA) is to be congratulated for this timely and critical initiative on spectrum policy reform. The recent FCC activity to promote unlicensed and unregulated use of the spectrum can only satisfy ad hoc spectrum uses and users where the presence of destructive interference is of short term impact and concern. This is a very limited slice of the needs of the vast majority of spectrum applications that require near-absolute certainty for interference-free, economical, reliable, and predictable provision of service. Although the "traditional" spectrum management system provides these certainties, it is also clearly guilty of failing to respond in a rational and timely manner to new and emerging demands on the spectrum. It is argued here that these shortcomings are largely institutional in nature and can be readily organized out of existence by the creation of a central and independent Spectrum Policy Agency (SPA), for lack of a better name, and other attendant changes such as a centralized and accurate database of U.S. frequency assignments.

My views arise from my direct participation as an electrical engineer, analyst and manager in the spectrum management process from 1975 to 2001. In the early part of that period I was Superintendent, Frequency Management for the Canadian Department of Transport, which had duties similar to its FAA equivalent. I supervised the design of software with the capability to automatically re-frequency the whole Canadian VHF air traffic control system. This was a challenge since the most difficult areas are contiguous, and part of, the US North-Eastern ATC system. I was also a Canadian delegate and spokesperson to the 1977 (aeronautical HF planning) and the 1979 (General) ITU WARC's, and head of delegation to the ICAO preparatory meetings for those conferences. In 1982 I joined the Canadian Department of Communications as Chief, Spectrum Policy, responsible primarily for spectrum utilization and allocation policy matters for the Fixed and Fixed-Satellite Services, and related services. I was primary author for a major spectrum policy review of the 1-10 GHz band, and participated in numerous ITU conferences and international preparatory meetings and bilaterals. From 1996 to 2001 I worked in Washington DC for Teledesic, LLC as Director, Regulatory Affairs. This experience has given me a long and direct association with national and international spectrum management, the U.S. processes, institutions and personnel, and allowed me to view first hand the issues and how they are dealt with in different environments. I have since moved on to a different field which does not give me the luxury of much time to spend on this topic.

Some believe there is a shortage of spectrum, while others maintain there is plenty. This not a cup half-full or half-empty argument, it is more like a blindfolded committee describing an elephant; that is, members are only capable of relating their part of the whole reality. In the case of the U.S. spectrum "shortage" perspective, no one can make a definitive statement because the radio spectrum has fragmented management, which is unevenly distributed and controlled within the Federal government system, within the FCC structures, and between all of them. The resulting lack of single oversight and knowledge of the precise existing uses and projected future needs of all users cannot help but yield a different answer to each participant. The integration of knowledge is the greatest challenge facing the development of coherent spectrum management policies.

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First Objective: Facilitate Modernized and Improved Spectrum Management System

The bifurcated management system, inadvertently or otherwise, creates two separate and competing camps for spectrum use, i.e. government departments and agencies vs. individuals and private enterprise. Managers of both systems listen to their constituents and defend them against demands of the other. This inhibits a full and unbiased hearing of the relative needs of spectrum users, preventing an unimpaired judgment of relative merit of each, and thus equitable access. Indeed, many have the feeling that the private sector gets what is left after the Federal government agencies are satisfied.

U.S. spectrum management successes thus far are more likely attributable to the skill and dedication of government employees than the processes within which they are required to operate. The substance of this Inquiry verifies these are serious issues that need to be resolved.

Should the Federal government consider establishing a centralized organization to perform these functions? First, it is necessary to define the components of spectrum management.. Spectrum management has three separable components:

1) Spectrum allocation (sometimes called spectrum policy)

These are policy decisions - what spectrum for what service, how much, when and how – and must take into account the entire spectrum, to enable a full consideration of alternatives and of all competing demands of different users. The policy constituency must consist of all users of the spectrum and thus requires a single, central agency.

2) Frequency assignment (coordination)

Frequency assignment is a highly technical function – that determines what precise frequency should be used at a given location, considering the technical, radio propagation and operational characteristics of that system and other systems sharing the band. This degree of detail means it is best performed when it is placed closest to the users. There may be many frequency assignment organizations, even ones for different cities for a single band.

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3) Authorization

Authorization entails application of statutory, equipment and operating standards to determine the use is "legal". It is tailored to specific classes of users, so it can be organized by type of user constituency.

These components are separable as long as lines of communication are open in all directions, and as they carry out complementary functions there is incentive for them to do so. All three are supported by another function, sometimes called spectrum engineering.

Although the current U.S. system in part recognizes the organizational needs of 2) and 3) above, it fails the spectrum policy process. No single unit is responsible for and can take into all competing uses and users of the spectrum.

This shortcoming results in unnecessarily denied uses, fragmented bands, and it invites political intervention. It reduces spectrum policy from the objective to the subjective, where it is often more important who is making the decision, than why it is made. Process becomes paramount, and can be used to create delay.

The primary risk that will be seen by NTIA and FCC of an independent Spectrum Policy Agency will be the loss of control of their constituents in allocation matters. The power to approve or deny the availability of access to spectrum has been used as a general policy tool to achieve other ends. However, if the objective is to improve spectrum access, it warrants a separate and independent process. The SPA will take into account these other needs as expressed by NTIA and FCC when granting spectrum.

The most difficult challenge in the creation of the SPA is in the appointment of its leadership. The leadership must be knowledgeable of the widest range of spectrum issues, uses and users, but it must not be partisan, either political or institutional. This likely means they must be drawn from senior career staff in the existing agencies, or from those with equivalent experience in the private sector, but not from political appointees who generally have short term personal agendas. One possibility is the creation of the SPA as an arms-length creature of both FCC and NTIA.

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The second most difficult issue is to maintain a public process while dealing with classified government demands. This will require compromise on all sides, with the goal of revealing as much information on classified systems as is required to understand the issues and decisions. Today, U.S. allocations accommodate highly classified systems without exposing them, but now the NTIA process is not public.

As described earlier, both the assignment and authorization functions are best performed in close contact with users, and should be retained by those agencies, with the furthest delegation of the assignment functions where possible. Both agencies should devise a "quality assurance" programs for the frequency assignment delegations, to ensure delegated assignment authority spectrum results in efficient spectrum use and in conjunction with the Spectrum Policy Agency, a reliable national frequency database is created and maintained. NTIA and FCC input and feedback to the SPA on all matters are essential to its success.

The allocation by "Who" (user) instead of "What" (use) means that two different users with identical needs and equipment may be forced into separate bands. Invariably, one of these bands will be congested in time, denying entry, while the other might otherwise be available. This division is endemic of the bifurcated allocation system and can largely disappear under a single Spectrum Policy Agency. The only excuse for exclusivity is to protect future growth which may not happen, or if it does, it may exceed the available spectrum anyway. In any case, a larger shared band is the best guarantee for future access.

The term "coordination" is popular because the term "assignment" is mixed in with the concept of "authorization". The ITU definition of "assignment" is the selection and designation of a frequency for a specific radio station. It does not include the authorization to use that frequency. This submission specifically proposes that the assignment function be delegated as close to the user as competently possible. Assignment normally includes frequency coordination with existing assignments in a band and would be carried out by the assignment entity. Although the international coordination function could be maintained by FCC and NTIA, it may be given to the Spectrum Policy Agency who must also lead international allocation processes.

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The coordination (assignment) of frequencies by a central agency for all levels of government is now essential because the concept of government/non-government and type of user instead of type of use has fragmented the spectrum available to these users.
This coordination (assignment) of frequencies by a central agency is essential because the concept of government/non-government and type of user instead of type of use has fragmented the spectrum preventing interoperability except by duplicating radio systems, and has made a single local assignment body infeasible.

The first task of the Spectrum Policy Agency should be to identify common interoperable bands, so the assignment function can be delegated to a single local entity dealing with immediate demands. If this were determined to be a national priority, it could be done in a short time.

State should continue to lead U.S. international activities, but preferably only for the diplomatic aspects regarding spectrum policy. Spectrum policy matters should be coordinated, determined and executed domestically and internationally by the Spectrum Policy Agency. International frequency coordination should be handled by either that agency or the FCC or NTIA as discussed above. State would continue to be responsible for the institutional aspects of the ITU, delegation formation, and U.S. organization of participation in ITU-T, ITU-D and non-spectrum aspects of ITU-R. The SPA would operate under State guidelines on international spectrum matters. The third party role played by State in the event of differences between the FCC and NTIA will no longer be required in this area.

Forecasts of growth of existing systems can be based on past growth if there is confidence in frequency assignment records. Studies should be carried out on trend changes and new developments. This information can be used by all parties to determine bands that should be candidates for change. Long range planning activities, per se, may be of limited value because the environment is quickly changing.

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Considerable benefit will be gained by laying a strategic path toward integrating the band fragmentation created by Type of User. This consolidation of spectrum should open bands not

available to some users, and should make some re-allocations easier. There is also a view that reducing the number of radiocommunication services is beneficial, particularly at the national level.

A comprehensive spectrum policy process is impossible with inadequate funding. Funding should not be discretionary, so as to avoid Congressional interference in due process. The most likely source of funding is an adjustable spectrum user fee paid by all spectrum users. This would be used to fund the SPA, the national frequency database, international activities, and directly related activities. Authorization and assignment activities would be funded as now.

The ITU Frequency Allocation process is glacial in speed and thus per force long-term,. The U.S. has had great successes in the ITU, but it appears to be taking too many resources. Several efforts to streamline the ITU process have failed, such as various panels of experts and, more frequent conferences. A real stumbling block to U.S. interests is the growing CEPT bloc, dominated by EC industrial policy, but still counting as individual country votes in the ITU.. Strong support from CITEL helps offset this, but the US is becoming more isolated because of its unique use of the spectrum.

A significant step would be the closer alignment of the U.S. and International Tables of Frequency Allocations. This will make future changes the U.S. wants easier to support by foreign countries, and to adopt changes wanted by others and won in the ITU, to be accommodated with U.S. uses. The SPA would be in an ideal position to do this.

Second Objective: Facilitate Policy Changes to Create Incentives for Achieving More Efficient and Beneficial Use of the Spectrum, and Provide a Higher Degree of Predictability and Certainty in the Spectrum Management Process as It Applies to Incumbent Users

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Spectrum efficiency should be measured subjectively, i.e. if there are unsatisfied demands, is it because existing users are using old technology, or is there simply not enough spectrum? Efficient spectrum is accessible spectrum, inaccessible spectrum is inefficient.

Efforts to determine “efficient” spectrum allocation by economic criteria are misleading and impossible by definition. Allocation is the division of spectrum between different and distinct services, separately identifiable because of a host of technical, operational and economic factors, making economic criteria as basis of choice, irrelevant. It is possible to use economic means to choose between competitors for frequency assignments within a single service, which do have common aspects. Auctions for example, have been used to ease the bureaucratic burden of choosing a licensee. Some parties, not understanding the basic components of spectrum management wrongly claim it as an efficient means of spectrum allocation.

Functional efficiency is an issue normally between the service provider and the user. The users will select the level of functional efficiency best meeting their needs. There are few cases requiring government intervention.

Metrics are to be avoided to describe efficiency as they change for every service, and even within a service (e.g. urban vs. rural), so are generally inapplicable to allocation decisions. In general, efficient spectrum use will mean the ability of a new user to gain use of a band. If the entrant is denied because of inappropriate or obsolete equipment of existing users, the existing user should be considered inefficient. An exception to the none-use of metrics may be in benchmarking efficient frequency assignment strategies (e.g. number of assignments per unit area).

All users should pay enough for spectrum so they quickly release spectrum they no longer need. An inefficient user (see above) should be required on short notice to accommodate the new user at his own expense. .

NTIA should establish a spectrum management quality assurance program, to ensure Federal users follow a established criteria for the assignment, recording and use of radio frequencies; collection of fees, with a threat of loss of management delegation where it is found sub-standard. The fee structure should not only fund allocation processes, it should serve as a deterrent to wasteful use, such as hoarding. Federal budget managers must accommodate new requirements and price increases each year, so spectrum charges should be manageable.

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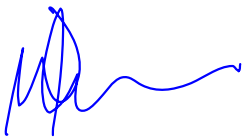
Temporary authorizations make up a small part of spectrum use, and will make no significant inroad on spectrum shortages where they exist. A secondary lease program to be effective must convey a level of permanence on the user that defeats the intent of the program. Temporarily unused Federal spectrum should be frozen pending a comprehensive spectrum review.

Receiver interference characteristics must first, not defeat that system's operating needs. To the extent that, secondly, they do not defeat the needs of another system, they require no regulation. If they do block another qualified entrant, and an improvement does not block their mission, a mandated change is justified.

These comments apply in part to the remaining Objectives stated in the NOI. The terseness of this comment is not intended to slight this process - it is a reflection of the limited time available to formulate a response.

Respectfully submitted
Tuesday, March 23, 2004



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