

BEFORE THE  
**Federal Communications Commission**

WASHINGTON, D.C. 20554

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FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF THE SECRETARY

In the Matter of )  
)  
Redesignation of the 17.7-19.7 GHz Frequency ) IB Docket No. 98-172  
Band, Blanket Licensing of Satellite Earth )  
Stations in the 17.7-20.2 GHz and 27.5-30.0 GHz )  
Frequency Bands, and the Allocation of )  
Additional Spectrum in the 17.3-17.8 GHz and )  
24.75-25.25 GHz Frequency Bands for )  
Broadcast Satellite-Service Use )

To: The Commission

**COMMENTS**  
**OF THE**  
**AMERICAN PETROLEUM INSTITUTE**

**AMERICAN PETROLEUM INSTITUTE**

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## SUMMARY

The Commission's proposed redesignation of the 17.7-19.7 GHz band would result in a reduction of more than 37% of the spectrum currently available for the Fixed Services ("FS"). The Commission previously identified the 18 GHz band as primary relocation spectrum for 1.8 GHz and 2.1 GHz incumbents required to relocate to accommodate Emerging Technologies, particularly Personal Communication Services ("PCS") and Mobile Satellite Services ("MSS"). As PCS licensees continue to build out their 1.8 GHz systems, and when 2.1 GHz incumbents begin to relocate in order to accommodate the introduction of MSS, the 18 GHz band will face greater demand. The reduction in spectrum availability, coupled with the growing demand for spectrum in which to build terrestrial systems, will place a very difficult burden on FS users.

While API is fundamentally opposed to any reduction in spectrum for FS, API strongly supports adoption of a rational band segmentation plan if such spectrum contraction is ordered. Sharing spectrum with ubiquitously deployed satellite earth stations on a co-primary basis has proven unworkable in the past. The prior experience of allocating the band 3700-4200 MHz to the satellite service on a co-primary basis with fixed services resulted in virtual closure of the band for new service systems.

In bands where sharing is proposed between terrestrial fixed services and satellite earth station licensees on a co-primary basis, coordination procedures must

prevent satellite earth stations from "sterilizing" spectrum. This sterilization results primarily from "full arc, full bandwidth" authorization regardless of operating parameters, and secondarily, from satellite applicants accepting higher than normal calculated interference levels from existing terrestrial systems in order to obtain earth station coordination, but not accepting the same interference levels from proposed new fixed services. API recommends rules to eliminate this *modus operandi*.

New Fixed Satellite Services ("FSS") licensees must bear the costs of relocating existing FS systems if coordinated shared operations are not possible. Relocation of fixed services has been addressed in other proceedings, and the transition rules resulting from those proceedings require PCS and MSS licensees to pay relocation expenses of incumbents to comparable facilities before commencing service. API opposes the adoption of a provision that would prohibit grandfathered fixed services from expanding or changing current operations in any manner that might increase interference to satellite earth stations. Allowing limited modifications gives continuing viability to existing fixed systems.

API requests that the Commission refrain from taking any final action regarding redesignation of portions of the 18 GHz band that affect FS uses until it has an opportunity to consider the 18 GHz Joint Working Group alternative proposal for band segmentation. Furthermore, prior to resolving the feasibility of sharing the

17.7-17.8 GHz band with Broadcast Satellite Services ("BSS"), the Commission should seek comment on the need for dedicating this spectrum to BSS. If the Commission determines that BSS needs the spectrum, then questions of spectrum sharing must be addressed.

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**COMMENTS  
OF THE  
AMERICAN PETROLEUM INSTITUTE**

The American Petroleum Institute ("API"), by its attorneys and pursuant to Section 1.415 of the Rules and Regulations of the Federal Communications Commission ("Commission" or "FCC"), respectfully submits the following Comments in response to the Notice of Proposed Rule Making ("Notice") adopted in the above-captioned matter on September 17, 1998.<sup>1/</sup>

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<sup>1/</sup> 63 Fed. Reg. 54100 (October 8, 1998). The date for filing these Comments was extended from November 5 to November 19, 1998 by Order, Chief, International Bureau; November 2, 1998 (DA 98-2231).

## I. PRELIMINARY STATEMENT

1. API is a national trade association representing approximately 350 companies involved in all phases of the petroleum and natural gas industries, including exploration, production, refining, marketing, and transportation of petroleum, petroleum products and natural gas. Among its many activities, API acts on behalf of its members as spokesperson before federal and state regulatory agencies. The API Telecommunications Committee is one of the standing committees of the organization's Information Systems Committee. The Telecommunications Committee evaluates and develops responses to state and federal proposals affecting telecommunications facilities used in the petroleum and natural gas industries.

2. At least nineteen of API's members hold FCC authority in the Fixed Microwave services for the operation of links in the 18 GHz band. Many of these licensees operate multiple links in the 18 GHz band. Some of these links serve as spurs off of long-haul microwave systems that employ frequency assignments from other bands, including 1850-1990 MHz ("1.8 GHz"), 2130-2150/2180-2200 MHz ("2.1 GHz"), and 5925-6875 MHz ("6 GHz"). Thus, a pipeline licensee that utilizes a 2 GHz or 6 GHz long-haul system may employ 18 GHz links from its backbone to a field office, refinery, central production facility, or city gate. As a result, these 18 GHz spurs frequently form an integral part of the overall production, refining and transportation process. During

emergency conditions, these communications facilities play a vital role for alerting public safety officials, coordinating response activities, and minimizing the impact of an incident upon workers and the general public.

3. The communications systems operated by API members are capable of monitoring pipeline pressure levels, temperatures, flow rates, volume and alarm sensors. These systems are designed to detect abnormalities, and respond remotely by adjusting valve settings and other parameters thereby maintaining safe operating conditions. These automatic safety features are employed throughout tens of thousands of miles of pipeline in this nation. Information from these Supervisory Control and Data Acquisition ("SCADA") systems, common throughout the industry, is transmitted over a variety of communications circuits, including 18 GHz microwave links. Without this reliable information, the likelihood and/or impact of pipeline ruptures, with their attendant health and environmental consequences, would be increased dramatically.

4. The Commission has proposed in this proceeding to redesignate the 17.7-19.7 GHz band for terrestrial Fixed Services ("FS"), Fixed Satellite Services ("FSS") and Mobile Satellite Services Feeder Link ("MSS/FL"). As a result, FS would be designated as primary in the 17.7 to 18.3 GHz band,<sup>2/</sup> and would lose its current

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<sup>2/</sup> FS and Broadcast Satellite Services ("BSS") are proposed to be co-primary in the 17.7-17.8 GHz band beginning in 2007.

co-primary status in the 18.3-18.55 GHz and 18.8-19.3 GHz bands, although the Commission has proposed that existing licensees be grandfathered. FS and satellite services would remain co-primary in the 18.55-18.8 GHz and 19.3-19.7 GHz bands. The Commission has proposed to limit satellite earth station blanket licensing to bands where the fixed services do not share spectrum with the satellite services.

## II. COMMENTS

5. A growing number of 18 GHz links have replaced facilities previously operated in the 1.8 GHz and 2.1 GHz bands, which were previously reallocated for Emerging Technologies, including Personal Communications Services ("PCS") and Mobile Satellite Services ("MSS"). As a result of these reallocations, the Commission has identified the 6 GHz band and the 18 GHz band as primary relocation spectrum for relocated FS users.<sup>3/</sup> However, it is increasingly difficult to find available spectrum in the 6 GHz band, as both Common Carrier and Private Operational-Fixed Microwave Service users migrate to this relocation spectrum, particularly in those urban and industrial areas where PCS entities first relocated incumbents. As a result, when the remaining PCS licensees build out their systems, and when 2.1 GHz incumbents (reported to be operating 12,000+ links, including private and common carrier licensees) are displaced by the MSS

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<sup>3/</sup> See *Second Report and Order*, ET Docket No. 92-9 (Aug. 13, 1993), discussing that the 17.7-19.7 GHz band would be available to existing 2 GHz licensees for relocation.

industry, the 18 GHz band will face significantly increasing demand. Since many of the links employed at 18 GHz support critical operations for local and state government and private industry, it is vitally important that the Commission limit further incursion into the 18 GHz band.

6. The proposed redesignation of the 17.7-19.7 GHz band as advanced by the Commission would result in a reduction of more than 37% of the spectrum currently available for FS licensing. This reduction in spectrum availability, coupled with the growing demand for spectrum in which to build terrestrial systems, would place a very difficult burden on FS users. It is in the public interest to protect this critical relocation spectrum. The ability of the Commission to meet ever increasing spectrum demands, whether through auction or some other process, depends on having adequate spectrum, protected from interference, for relocating displaced licensees. This is not only true for the ongoing and continued relocation of licensees from the 1850-1990 MHz band, but will be even more important for the ultimate relocation of 2.1 GHz terrestrial licensees which far outnumber those previously authorized in the 1.8 GHz band.

7. Although API generally supports elements of the proposal made in the Notice, these comments include recommendations that seek to further protect incumbent fixed services from the loss of vital 18 GHz spectrum. These include providing for

co-equal coordination procedures, permitting limited modifications of grandfathered systems, and adopting relocation rules established in prior proceedings.

**A. Spectrum Sharing Issues**

8. API is fundamentally opposed to any reduction in spectrum availability for FS use. Nevertheless, given the presumption that portions of the 18 GHz band will be reallocated for satellite services, API strongly supports adoption of a rational band segmentation plan. Sharing spectrum with ubiquitously deployed satellite earth stations on a co-primary basis has proven unworkable in the past, and similar sharing in the 18 GHz band would result in further loss of spectrum for fixed services and exclusion of fixed services from large geographical areas. The prior experience of allocating the 4 GHz band (3700-4200 MHz) to the satellite service on a co-primary basis with fixed services resulted in virtual displacement of fixed services from the band. Sharing of the 4 GHz allocation was premised on the deployment of a "few" earth stations, located principally at distances sufficiently removed from major metropolitan areas to avoid interference with existing microwave facilities. However, in recent discussions at meetings of both the National Spectrum Managers Association ("NSMA") and the Fixed Wireless Communications Coalition ("FWCC"), it was reported that, because of the proliferation of satellite earth stations, it is now extremely difficult to coordinate new terrestrial point-to-point microwave systems in the 4 GHz band.

9. Discussions between FS and satellite interests within the forum of the 18 GHz Joint Working Group ("JWG")<sup>4/</sup> have led FS interests to believe that proposed satellite systems operating in the 18 GHz band will employ "up to about four earth stations" to meet feeder link requirements. As with the 4 GHz experience, these earth stations are proposed to be generally remote from major metropolitan areas. This *a priori* understanding of proposed satellite earth station requirements is very reminiscent of proposed C-Band satellite operations, prior to system implementation.

10. In order to ensure that the 4 GHz experience is not repeated in the 18 GHz band, and to facilitate satellite system implementation consistent with current mutual understandings, API recommends that satellite feeder link earth stations be limited to a total of four per satellite operator and that these four terminals not be located any closer than 100 kilometers from the largest fifty metropolitan areas. It is anticipated that this limitation will satisfy satellite system requirements and allow for reasonable growth in FS 18 GHz systems in larger metropolitan areas. Spectrum in bands other than 18 GHz is expected to be available for system expansion in cities smaller than the fifty largest.

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<sup>4/</sup> The 18 GHz Joint Working Group is an informal group of satellite service and terrestrial service interests formed to analyze the feasibility of sharing between the respective services in the 17.7-19.7 GHz band. This group is not sponsored by a recognized organization such as the Telecommunications Industry Association or the National Spectrum Managers Association.

11. API supports adoption of the Commission's proposed rules to eliminate sharing spectrum with blanket licensees in the 18 GHz band. Since any consumer could purchase a personal earth station at a local retail store and operate that terminal anywhere at any time under a blanket license, the resulting interference which would occur to FS systems would be intolerable. This nation's vital petroleum and natural gas industries, its railroads, its utilities, and its public safety services would find it practically impossible to operate responsibly in such an environment. With potentially millions of personal earth stations in the hands of consumers, it would be the incumbent FS licensees that would be forced to relocate from the 18 GHz band. The ultimate result of a sharing arrangement with blanket licensees would not be spectrum sharing at all -- it would be forced and presumably uncompensated relocation of FS users from the 18 GHz band.

Uncoordinated transmitters coexisting with coordinated, individually-tailored communications systems used to monitor and operate a petroleum pipeline, is contrary to the public interest. Should the FCC be persuaded to adopt a rule that allows blanket licensing of uncoordinated satellite earth stations, it should provide for the fully reimbursed relocation of incumbents to comparable spectrum elsewhere.

12. In those bands where sharing is proposed between terrestrial fixed services and satellite earth station licensees on a co-primary basis, coordination procedures must be addressed. Satellite earth stations have a tendency to "sterilize" spectrum from use by

other services.<sup>5/</sup> This sterilization is caused by two coordination procedures: first, earth stations are coordinated “full arc, full bandwidth,” regardless of operating parameters; and secondly, satellite applicants have often accepted higher than normal calculated interference levels from existing terrestrial systems in order to obtain earth station coordination, but do not accept the same interference levels from proposed new fixed services.<sup>6/</sup> Coordination of “full arc, full bandwidth” operations is spectrally and geographically inefficient and prevents coordination of fixed services in areas and bands that are not used by satellite operators. To reduce this problem, API strongly recommends that the Commission require reasonable operating parameters of satellite operators to promote spectral and geographic efficiency. Further, the practice of satellite applicants “accepting” interference from existing systems to obtain coordination, but then not accepting the same interference levels from new fixed services is grossly unfair to terrestrial users. The FCC should require satellite applicants to accept the same level of interference from new terrestrial fixed services as they agreed to for gaining initial authorization.

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<sup>5/</sup> Sterilization is a term used by frequency coordinators to characterize the inability to coordinate new FS systems in a particular geographic area because a satellite earth station “exclusion zone” creates a “sterile” environment similar to an antibiotic in a petri dish; i.e., “nothing will grow there.”

<sup>6/</sup> These coordination policies were acknowledged by microwave frequency coordinators at recent NSMA Working Group 3 meetings. NSMA Working Group 3 develops coordination procedures for intra- and inter-service sharing.

13. The proposed band plan in the Notice provides for secondary operations for all "non-primary" services throughout the 17.7-19.7 GHz band. Although it is not anticipated that satellite interests would incur the expense to provide satellite services that are secondary, nonetheless, secondary use by satellite services of spectrum where fixed services are located would create additional difficulties that must be resolved. Although allowing secondary use on a non-interference basis is spectrally efficient and generally desirable, the standards for non-interference must be strict, i.e., no interference with primary users under the most rigorous standard. Secondary use interference in microwave bands can be difficult and time consuming to prove (especially if the interfering signal emanates from a mobile transmitter), and may cause more service outages during particular times of the year due to seasonal factors that affect propagation. Even limited outages can seriously affect safety of petroleum and gas pipeline operations. API recommends that the Commission require that coordination of secondary users satisfy non-interference criteria that is more stringent than that afforded to primary users.

**B. Spectrum Allocation and Channeling Plans**

14. The Commission has requested proposals for channeling plans for terrestrial fixed services operating in the 17.7-19.7 GHz band to address the following services: CARS, auxiliary broadcasting, local television transmission, fixed point-to-point, and low power point-to-multipoint. Notice at ¶ 35. API is aware that at

least one other potential participant in this matter has worked on an alternative band segmentation plan that may have a less severe impact on incumbent fixed service licensees. While API expects to address alternative plans in its Reply Comments, at this point, it simply urges the Commission to carefully consider proposals that have a less onerous effect on incumbent fixed users of this band.

15. The Commission proposes to allocate the 17.3-17.8 GHz band to BSS in accordance with the ITU Region 2 allocation that becomes effective on April 1, 2007. This allocation overlaps with the already limited primary FS allocation in the 17.7-18.3 GHz band, and the Commission seeks comment on whether sharing in the 17.7-17.8 GHz band is feasible. Notice at ¶ 79. Before addressing the sharing question, API points out that the ITU allocation does not resolve the question of whether BSS actually needs the spectrum in the first place. Prior to resolving the feasibility of sharing with FS users, the Commission should seek comments on the need for this spectrum by BSS. If a determination is made that BSS needs that spectrum, then questions of sharing should be addressed.

### **C. Grandfather Rights For Fixed Services**

16. The Commission has requested comment on providing grandfather rights for fixed services in the bands 18.3-18.55 GHz and 18.8-19.3 GHz where ubiquitously-

deployed earth stations will be located. Incumbent FS users will retain primary status for their prior existing operations, but be secondary status with respect to expansions or modifications of systems in these bands. The Commission proposed that coordination with existing fixed service licensees be required for new FSS users.

17. API supports protecting existing FS licensees in the 18 GHz band.

However, it is unclear how new FSS operations can occupy common spectrum with existing FS systems without causing interference. Moreover, it seems unlikely that new FSS operations could co-exist with FS operations in the same band. Accordingly, API proposes that new FSS licensees bear the responsibility of relocating existing FS systems to comparable facilities when an FS system's licensed frequency is not located within the adopted primary allocation for FS.

18. However, should the Commission determine that grandfathering is appropriate for existing FS licensees, API opposes the adoption of a provision that would prohibit "grandfathered terrestrial fixed service licensees . . . to expand or change their current operations in any of the bands in which grandfathering applies in any manner that might increase interference to satellite earth stations." Notice at ¶ 40. Such a rule would artificially constrict FS operations and is contrary to past FCC policy. In the Emerging Technology proceeding, by Public Notice on May 14, 1992, the Commission stated that its policy was to continue accepting applications for modifications to existing

systems including “minor modifications, changes in antenna azimuth, antenna beamwidth, antenna height, authorized power, channel loading, emission, station location, and ownership or control; reduction in authorized frequencies; or addition of frequencies not in the 2 GHz band.”<sup>2/</sup> This policy, which allows for the continuing viability of grandfathered fixed systems, should be extended to the 18 GHz band. Without this policy in place, the end of an antenna site lease agreement, for example, could mean that a vital link would be lost, thereby rendering an entire system inoperable.

**D. Relocation Provisions**

19. As the Commission noted in the Notice at ¶ 41, relocation of fixed services has been addressed in other proceedings, notably the Emerging Technology proceeding, ET Docket No. 92-9 and the Mobile Satellite Service at 2 GHz allocation proceeding, ET Docket No. 95-18. The transition rules resulting from those proceedings require PCS and MSS licensees to pay relocation expenses of incumbents to comparable facilities before commencing service, as determined through voluntary and mandatory negotiation.

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<sup>2/</sup> Third Report and Order and Memorandum Opinion and Order, ET Docket No. 92-9 (Aug. 13, 1993).

20. API supports extension to the 18 GHz band of the transition rules which have worked efficiently in facilitating entry of PCS into the 1.8 GHz band and have been adopted by the FCC as the appropriate relocation mechanism for the upper 200 SMR channels in the 800 MHz band. The transition rules balance the promotion of emerging technologies with the need to protect vital incumbent communication systems. FSS operators will certainly develop business plans based on total costs of system implementation, which should include the actual cost of accessing encumbered spectrum; they should not receive an economic windfall by imposing any spectrum-related costs on terrestrial fixed service operators, but rather should ultimately pay the necessary costs of relocating FS licensees in order to access new spectrum.

### **III. CONCLUSION**

21. For the most part, the Commission has adequately and fairly addressed the needs of both terrestrial fixed services and satellite services in the Notice of Proposed Rule Making. Resolution of the issues and concerns raised by API in these Comments is essential to continued and growing operation of fixed services in the 18 GHz band. Such operations are critical to safety of the public, environment and workers, and allow for efficient operation and control of petroleum and gas pipelines. As spectrum is increasingly made available to commercial services and other emerging technologies, the needs of existing users must be given careful and serious consideration.

**WHEREFORE, THE PREMISES CONSIDERED**, the American Petroleum Institute respectfully urges the Federal Communications Commission to act in a manner fully consistent with the views expressed herein.

Respectfully submitted

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