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BEFORE THE

Federal Communications Commission

WASHINGTON, D.C. 20554

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JUN - 8 1992

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

In the Matter of)
)
Redevelopment of Spectrum to)
Encourage Innovation in the)
Use of New Telecommunications)
Technologies)

ET Docket No. 92-9

To: The Commission

COMMENTS OF EL PASO NATURAL GAS COMPANY

Respectfully submitted,

EL PASO NATURAL GAS COMPANY

Keller and Heckman
1001 G Street, N.W.
Suite 500 West
Washington, D.C. 20001

Its Attorneys

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SUMMARY

El Paso Natural Gas Company is greatly concerned about the possibility that critical telecommunications systems licensed in the Private Operational-Fixed Microwave Service (OFS) frequency bands 1850-1990 MHz and 2110-2150/2160-2200 MHz will be displaced as a result of the Commission's proposal to reallocate this spectrum to a "new technologies reserve." El Paso makes extensive use of the targeted microwave spectrum to serve vital point-to-point telecommunications requirements including real time monitoring and remote control of its pipeline network. This telecommunications capability is used to protect the public well-being, throughout El Paso's interstate natural gas pipeline system.

Based upon careful analysis of the Commission's proposal, El Paso concludes that sufficient demand for the ill-defined group of "new technologies" has not been demonstrated to warrant the wholesale reallocation of 230 MHz of the valuable spectrum resource to a "new technologies reserve." Moreover, the Commission's seemingly arbitrary choice to limit its analysis of candidate frequency bands only to those between 1-3 GHz renders its proposal defective since numerous spectrum blocks outside

this frequency range exist which could accommodate new technologies without the disruption and negative impact on the public interest and well-being which will occur should the Commission reallocate spectrum in the manner proposed.

Further, even within the 1-3 GHz range, sufficient spectrum exists in bands other than those proposed for reallocation in which new technologies could be accommodated at less cost and with less harmful disruption to existing critical services. The Commission has not fully considered the impact upon the public that reallocation of the targeted spectrum would create. The Commission's faith in spectrum from higher frequency ranges, fiber optics, and satellite technology as adequate replacements for the targeted spectrum is misplaced since these alternatives will not provide the reliable communication service now available with 2 GHz spectrum.

Finally, international developments do not compel immediate reallocation in the manner proposed by the Commission. In fact, when all relevant factors are considered, it is possible that a premature allocation of spectrum could have a negative impact on deployment of proposed new technologies.

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El Paso Natural Gas Company (El Paso), by its attorneys, pursuant to the invitation extended by the Federal Communications Commission (Commission) in its Notice of Proposed Rule Making (Notice)^{1/} in the above-styled proceeding, respectfully submits the following Comments for consideration by the Commission.

I. PRELIMINARY STATEMENT

1. El Paso Natural Gas Company is a major interstate natural gas transmission company whose 81 compressor stations and 20,810 miles of pipeline deliver over one trillion cubic feet of natural gas annually to

^{1/} Notice of Proposed Rule Making, 7 FCC Rcd. 1542 (1992).

California, Arizona, Southern Nevada, New Mexico, and West Texas.

2. The backbone of the communications network that serves this complex pipeline is a 140 hop private microwave system, over half of which operates in the 1850-2200 MHz band. This system is of strategic importance in monitoring and controlling remote compressor stations, valves, and meter stations to ensure the uninterrupted delivery of a primary source of energy to California and the southwestern United States.

3. El Paso's pipelines traverse some of the most remote territory in the United States where common carrier service is either inadequate or unavailable. Other options such as satellite or fiber optic cable are impractical and do not afford the flexibility, availability, and reliability required to remotely monitor and control a large and dynamic pipeline system. The threat of disruption of our pipeline throughput caused by the possible loss of suitable microwave spectrum is of grave concern, since the resulting unavailability of natural gas could cause serious hardships to schools, industry, hospitals, and private homes and could even endanger lives and property.

4. As critical as instantaneous communications is to the normal operation of El Paso's pipeline in ensuring the uninterrupted availability of a vital energy source to the public, it takes on an added dimension in the event of a pipeline break or other emergency situation. The importance of reliable communications afforded by El Paso's private microwave network in detecting and quickly responding to and controlling such emergencies cannot be overemphasized. Should such a situation occur, the ability to remotely shut off the flow of gas and direct repair efforts over the microwave system are vital in preventing further damage or injuries.

II. COMMENTS

A. **Sufficient Present Demand for New Technologies Has Not Been Demonstrated to Warrant Wholesale Reallocation of 230 MHz of the Valuable Spectrum Resource**

5. The instant proceeding is designed to create specific spectrum areas to be dedicated for the accommodation of "emerging telecommunications technologies."^{2/} The Commission perceives the need for a spectrum allocation to accommodate pending requests to

^{2/} Notice, ¶ 1.

implement several new technologies, possibly including personal communications services (PCS), data PCS (wireless LANs), a generic mobile satellite service, digital audio broadcasting (DAB), and low earth orbit satellites (LEOS).^{3/} Apparently, the Commission is operating under the belief that near-term public demand for these services will materialize sufficiently to require at least 230 MHz of spectrum to meet new technology needs. Moreover, the Commission's decision to allocate spectrum for new technologies is based, at least in part, on the perception that new technologies are being developed and implemented in other countries and that the United States will "fall behind" as a technological leader should the new technologies not be rapidly deployed in the U.S.^{4/}

6. El Paso is disturbed by the absence of empirical evidence indicating that either premise which could possibly justify the contemplated allocation proceeding is true. Although proponents of new services have placed several proposals before the Commission, neither the Commission nor the new technology proponents have offered a clear showing that serious studies have been

^{3/} Notice ¶ 4.

^{4/} Notice ¶ 5.

conducted concerning actual near-term demand levels for the proposed services which the Commission seeks to accommodate. In fact, it has been shown that at least one of those technologies may have very limited overall market appeal.^{5/}

7. It is incumbent upon the Commission to demonstrate in any reallocation decision that the Agency's choices will serve the public interest.^{6/} In the instant case, the Commission's tentative decision does not meet the requirement of its public interest mandate. It is premature, at best, for the Commission to consider reallocating spectrum to new uses which are commercially unproven when the operations now conducted in the targeted spectrum support large scale public interest tasks. Certainly, the Commission must realize that the protection of human well being is at least equal to the value of the possible promise of benefits which might be delivered by the proposed new technologies should a market for such technologies develop in the future. El Paso notes that all the proposed new services are "convenience oriented" and not vital to the public well-being as are the OFS operations

^{5/} See Reply Comments of the American Petroleum Institute, FCC Gen. Docket 90-314. See also Statement of John E. DeFeo at FCC En Banc Hearings on PCS (December 6, 1991).

^{6/} 47 USCA § 303(c) (1990).

being performed in the target spectrum. Accordingly, by its arbitrary decision to accord such uses a higher allocation priority than safety users, the Commission has violated its statutory directive^{7/} as well as firmly established legal precedent.^{8/} Moreover, while the Commission alludes to overseas developments,^{9/} the Commission provides very little specific detail demonstrating that allocation proceedings for new technologies have been finalized or that significant near-term market demand for the proposed technologies has or will materialize overseas. Accordingly, the Commission's proposal is premature since overseas deployment of new technologies has not been demonstrated to be underway or even in advanced preparation stages. Additionally, even in the few cases where certain new technology systems have been made available, operations have not met with significant consumer demand.^{10/} Since scant evidence exists to suggest that the proposed new technologies must be deployed immediately, and since the targeted new technologies spectrum now provides services critical to the well-being of

^{7/} 47 U.S.C. § 151 (1991).

^{8/} National Association of Broadcasters v. FCC, 740 F.2d 1190, 1214 (1984).

^{9/} Notice ¶ 5.

^{10/} See Reply Comments of the American Petroleum Institute in General Docket No. 90-314 at pp. 12-13.

the public, the public interest will not be served by an instant reallocation of 230 MHz of valuable spectrum to speculative use as proposed by the Commission.

B. The Analysis By Which the Commission Selected Proposed "New Technology" Spectrum Is Insufficient Since it Did Not Consider Less Disruptive Alternative Spectrum Choices

8. In order to choose the spectrum which would offer the most suitable home for new technologies, the Commission allegedly relied on several factors including: cost of equipment, amount of spectrum available, feasibility of relocation of incumbent users, FCC-controlled non-government spectrum availability and international developments.^{11/} Using these criteria, the Commission's Office of Engineering and Technology (OET) performed a spectrum study to determine which spectrum bands would provide the optimal home for new technologies.^{12/} The resulting report,^{13/} determined that spectrum in the 1-3 GHz range represents the most desirable spectrum locus for the

^{11/} Notice pp. 5-6.

^{12/} Notice ¶ 11.

^{13/} "Creating New Technology Bands for Emerging Telecommunications Technology" FCC/OET TS92-1 (January 1992).

development of new technologies.^{14/} El Paso believes that the study is flawed; and that, when thorough analysis is applied to each of the evaluative factors employed, it becomes evident that the proposed reallocation of the bands 1.85-1.99 GHz and 2.11-2.15/2.16-2.20 MHz for new technologies would constitute a major allocation policy error.

9. El Paso is concerned over the Commission's decision to limit consideration of candidate frequency bands strictly to the 1-3 GHz range because of the agency's belief that the availability of state-of-the-art technology for equipment expected to be used in the new services will restrict operations in those services to spectrum below 3 GHz; and because spectrum below 1 GHz does not appear to offer any possibilities for reasonable availability.^{15/} The Commission has not shown specific evidence in either the OET study or in the Notice that mobile technology will not be capable of using higher frequency ranges over the near term. The Commission's lack of a detailed analysis on this point is especially disturbing since the agency previously has been made aware of the fact that in the "condensed cell"

^{14/} Id.

^{15/} Notice, ¶ 12.

configuration in which certain of the new technologies (PCS and data-PCS) are designed to operate, frequencies at higher ranges will provide more efficient re-use capability and better operating potential, which could mean that equipment design using those spectrum options could prove easier than would be true should 1-3 GHz spectrum be allocated for those purposes.^{16/}

10. The Commission's perfunctory dismissal of the use of spectrum below 1 GHz for new technologies accommodation also demonstrates a lack of serious analysis. This is particularly true since it can be demonstrated that for low power transmission in urban environments, frequencies below 1 GHz provide more desirable propagation characteristics with respect to penetration of buildings, leaded glass and other signal obstructions than do frequencies in the 1-3 GHz range.^{17/} El Paso is convinced that the Commission should perform a frequency analysis of significantly greater depth before reaching any final conclusion that, from a practical equipment standpoint, only

^{16/} See Comments of the American Petroleum Institute in RM-7140, p. 14.

^{17/} See: Statement of Carl Bailey, Chevron Information Technology Company, at FCC En Banc Hearings on PCS (Dec. 5, 1991).

frequencies in the 1-3 GHz range will provide an adequate spectrum home for new technologies.^{18/}

11. Further, even if careful study demonstrated that frequencies in the 1-3 GHz range were the optimal spectrum choices in which to accommodate new technologies, the Commission study identifying the bands 1.85-1.99 GHz, 2.11-2.15 GHz , and 2.16-2.20 GHz as the best choices in which to locate proposed new technologies does not provide the significant analysis necessary to develop the most efficient, cost effective and least disruptive allocation of spectrum in this instance. For example, 100 MHz of spectrum could be allocated on a shared basis in the 2.50-2.60 GHz band for new technologies since the Multipoint Distribution Service (MDS) and Instructional Fixed Television Service (IFTS) use of this spectrum is light and because, unlike the OFS users operating in the currently targeted bands, absolute reliability in the MDS and IFTS are not vital to public health and safety. Another 120 MHz of spectrum is

^{18/} For example, two large blocks of lightly loaded spectrum exist in the range 512-608 MHz and 614-806 MHz. These blocks provide ample spectrum, desirable propagation characteristics, are under FCC allocation control, and are predominantly used to provide entertainment services rather than safety-oriented communications. Accordingly, these blocks could be allocated to new technologies without disruption of safety-oriented services and, since these bands are home to fewer licensees than the target spectrum, they could be cleared faster for new technology users.

available from the band 1.99-2.11 GHz. This band is used primarily for "broadcast auxiliary" operations; and while such uses undoubtedly have value, the Commission seems to have assigned such uses greater value than the health and safety protection operations now conducted in the target spectrum. Further, while the use of POFs systems to protect the public has increased substantially over the past decade, much of the electronic news gathering (ENG) activity performed in the broadcast auxiliary band has migrated to satellite technology in recent years. Accordingly, the commission should give serious consideration to these bands as spectrum reserve locations.

12. Additionally, the Commission has not seriously examined the possibility or suitability of using federal government spectrum in the 1-3 GHz frequency range for accommodation of new technologies.^{19/} The Commission has stated that it will avoid attempts to obtain government-dedicated spectrum for new technology accommodation because

^{19/} Notice, ¶ 21. See also Motion to Suspend - FCC ET Docket No. 92-9, filed by Association of American Railroads, Large Public Power Council, and the American Petroleum Institute (April 10, 1991). (Hereinafter "Petition to Suspend").

of the Commission's belief that obtaining government spectrum would be a time consuming and uncertain process.^{20/} However, a significant amount of lightly used government spectrum in the 1-3 GHz range is available. Congress is now considering whether to require reallocation of the 1.71-1.85 GHz government band to private use. The Commission should investigate the possibility of using this spectrum as a home for new technologies or, alternatively, as a home for displaced 2 GHz OFS licensees prior to any sweeping reallocation process. Further, as has been demonstrated to the Commission,^{21/} the band 2200-2290 MHz which is within the 1-3 GHz range and is dedicated to federal government operations, is lightly used according to statistics compiled by the National Telecommunications and Information Administration (NTIA).^{22/} The Commission and NTIA may work together to make underutilized government spectrum available to private users without the need of a congressional mandate.^{23/} Accordingly, El Paso submits that, when the potential impact on the public well-being is

^{20/} Id.

^{21/} See Petition to Suspend, n.16, supra.

^{22/} Federal Spectrum Usage of the 1710-1850 and 2200-2290 MHz Bands, NTIA TR 92-285 (March 1992).

^{23/} Petition to Suspend, pp. 12-14.

considered, the Commission must take into account the potential utilization of government spectrum as a home for new technologies or for licensees displaced by new technologies prior to any final reallocation decision. Although the Commission states that the possibility of use of the 1.71-1.85 GHz band as replacement spectrum for displaced licensees has been raised "in a preliminary fashion" with NTIA^{24/} and NTIA's director is on record as stating that the band is too crowded to accommodate "all" current 2 GHz OFS licensees, the ramifications of the proposed reallocation compel formal analysis by the Commission and NTIA to determine viability of use of the Federal Government 2 GHz band by private users before the agency attempts finalization of this proceeding.

C. The Commission Has Not Sufficiently Considered the Technical Ramifications of Reallocation of POFS Spectrum

13. The Commission study is seriously flawed with respect to relocation of OFS services to either higher frequency bands or alternative media. Apparently, the Commission believes it is technically feasible to replace a loss of the targeted spectrum bands through the use of fixed

^{24/} Notice, n.18.

microwave bands above 3 GHz, as well as fiber optic and satellite technologies.^{25/}

14. The Commission has failed to take into account that frequencies above the 3 GHz range cannot provide the same long-haul capabilities that assignments from the targeted spectrum bands offer. Significantly, several of the long-distance paths -- those up to 69 miles in length -- which are included in the El Paso system, employ assignments from the band 1.85-1.99 GHz. Numerous other long paths -- up to 48 miles in length -- are operated by El Paso in the 2.11-2.15 GHz band. Since frequencies above 3 GHz do not have the same long-distance transmission characteristic of frequencies in the 2 GHz range, replacement with higher range frequencies would require El Paso to implement numerous "relay points" in order to provide the same service El Paso now receives from the 1.85-1.99 GHz and 2.11-2.15 GHz bands. The addition of such relay points will compromise the reliability of the El Paso communications system because the possibility of outages increases dramatically with the imposition of each retransmission point in the system. Further, rights-of-way which would be necessary for construction of the "relay points" will be

^{25/} Notice, ¶ 20.

prohibitively expensive and, in some cases, practically impossible to obtain. Further, the costs of reconfiguring the El Paso system would be grossly prohibitive and, of course, would have to be passed on to utility rate payers. Cost barriers are compounded by the fact that El Paso's maintenance costs for the additional equipment needed to use higher range spectrum will also increase substantially.

15. The Commission's reliance on fiber optic and satellite technologies as adequate replacements for the microwave radio spectrum now used by El Paso is misplaced. Fiber optic systems simply do not provide the reliability that microwave radio facilities offer since fiber optic systems are susceptible to rupture. Certainly, during disasters such as earthquakes, fiber optic facilities are vulnerable but, even in such mundane cases as excavation for construction projects, fiber optic cable can be severed, resulting in a complete loss of critical services.^{26/}

16. Satellite technology will not provide an acceptable substitute service since time delays inherent in

^{26/} For further discussion of the technical problems of replacement of 2 GHz microwave channels with fiber optic or satellite technologies, see Reply Comments of the American Petroleum Institute, FCC Gen. Doc. 90-314, pp. 16-19 (January 5, 1991).

signal relay through satellite systems can often compromise SCADA system design. This is especially true for systems designed to provide pipeline "leak detection" capability since "real time" monitoring and control are absolutely essential to prevent the possibility of harm to the public safety. Moreover, even if fiber optic and satellite systems could provide a complete replacement for El Paso's microwave system, El Paso is concerned that such a move would place its vital monitoring and control systems in the hands of commercial carriers. In times of outages, it is possible that quick restoration of service to El Paso might not be the first priority of a given carrier. El Paso is deeply concerned that potential service lapses and system unreliability could result in catastrophic consequences for the well-being of the public throughout the El Paso service area.^{27/}

^{27/} El Paso reminds the Commission that heightened reliability provided the original impetus for private microwave allocations. In the Matter of Allocations of Frequencies in the Bands Above 890 Mc., FCC Docket No. 11866, 27 F.C.C. 359 (1959). In the interim since the Commission's original OFS allocation decision, the reliability of the public telephone network has not been shown to have improved to any significant degree. See "Asleep at the Switch?", Federal Communications Commission Efforts to Assure Reliability of the Public Telephone Network; 102d Congress, 1st Session, House Report 102-420 (December 11, 1991).

D. The Commission's Proposed Transition Plan Does Not Adequately Meet the Needs of Incumbent Spectrum Users

17. El Paso asserts that the proposed reallocation of OFS spectrum to new technologies will not serve the public interest. However, should the Commission reach the conclusion that the proposed reallocation will serve the public interest, the transition plan detailed in the Notice is inadequate to provide an orderly transition without harmful service disruption possibilities. The Commission has immediately stymied any real growth of pre-existing microwave systems in the effected spectrum bands since the Commission proposes that most applications for new 2 GHz OFS facilities will be granted only on a secondary basis.^{28/}

18. The Commission's proposed 15-year transition period will not allow sufficient time for the investment made in 2 GHz OFS microwave systems to be fully realized, since much of the equipment currently in use is reasonably

^{28/} Notice, ¶ 23.

anticipated to operate in a satisfactory manner for an additional 20 years.^{29/} Accordingly, should the Commission proceed with the proposed reallocation without providing adequate 2 GHz "replacement spectrum", current 2 GHz OFS licensees must be granted an indefinite "grandfather period" with all modifications and additions to present systems being licensed on a "co-primary" basis with new technology licensees.

19. Additionally, the Commission proposes liberal allowance of "buyouts" of spectrum by new technology proponents.^{30/} However, El Paso asserts that this plan will allow new technology proponents to operate in spectrum not presently occupied; and, by simply "waiting out" current users until the end of a specific "grandfather period", usurp OFS spectrum now in use without rendering any actual payment to displaced licensees. El Paso is concerned that the significant investment made by natural gas ratepayers in microwave systems which provide safe and efficient pipeline transportation will be lost because of the Commission's

^{29/} El Paso notes that interstate natural gas pipeline systems operate under Federal Energy Regulatory Commission rules which require that some elements of the capital plant costs for such systems be depreciated over an extended 50-year period.

^{30/} Notice, ¶ 26.

precipitate action. More importantly, El Paso is concerned that it will lose the efficient and reliable telecommunications services it now employs to protect the public throughout its service area.

E. The Proposed Reallocation Is Not Compelled by International Developments

20. The Commission notes that several proposed technologies are being considered or are under development overseas, and further observes that foreign governments are moving to allocate spectrum between 1 GHz and 3 GHz for mobile services.^{31/} Accordingly, the Commission operates under an apparent belief that an identical domestic spectrum allocation will ensure international equipment interoperability and will enhance the domestic manufacturer of new technology equipment for export overseas. While an international transmission standard for proposed new technologies may be desirable, the Commission's faith in a "common spectrum allocation" to provide international operability and stimulate domestic equipment production is misplaced. Numerous transmission methods for mobile technologies now exist throughout the world. Also, software protocols which control global communications hardware vary

^{31/} Notice, p. 4.

widely in the international marketplace. It appears that this situation will continue. Accordingly, even if a common allocation could be agreed upon, international equipment interoperability would not be realized since the signalling protocols would still differ markedly.

21. Additionally, since numerous discrete frequency bands exist within the 1-3 GHz frequency range, and since it is not certain which spectrum from those specific bands will be allocated by different nations to the various new technologies proposed, it is premature for the Commission to make an early allocation decision reallocating specific bands to specific services. This is particularly true since subsequent spectrum allocations of other nations likely will differ from those made by the Commission. Nor will a "common allocation standard" stimulate domestic hardware production. While the domestic telecommunications industry new technology design abilities are unquestioned, once the "design stage" of a new technology is complete, equipment manufacturing generally moves offshore where the costs of labor are considerably lower. Accordingly, the Commission's faith in a common frequency allocation for new technologies to stimulate American manufacturing and exports is misplaced.

III. CONCLUSION

22. El Paso is concerned that, through the instant proceeding, the Commission will use broad generalities and unsubstantiated claims of a need for immediate implementation of new technologies to eject literally thousands of operations from spectrum which has been used successfully to protect the public well-being for many years. El Paso reminds the Commission of its statutory duties to reach its allocation decisions based on thorough analysis of the facts and upon a clear showing that the allocation decision reached will best serve the public interest, convenience and necessity. The serious negative public impact which the proposed reallocation decision could have, coupled with the lack of substantial evidence that the proposed new technologies are: (a) in great present public demand or (b) may only be accommodated by use of the 2 GHz OFS spectrum, compels the Commission to more fully analyze all factors involved prior to rendering any final decision in this proceeding.

23. When proper analysis is performed, El Paso is convinced that the Commission will find that a near term