this number does not take into consideration the number of 2 GHz facilities that cannot be accommodated at higher frequencies because of climatic conditions. Rainfall attenuation affects the signal transmission at higher frequencies. In certain regions of the country which are subject to high rainfall, such as the Gulf of Mexico, the 2 GHz band has a proven history of providing high reliability for required critical communications.

The propagation characteristics of higher microwave bands could make it necessary to construct additional "hops" in order to accommodate 2 GHz path lengths. In many areas of the country it is an extremely difficult, lengthy and expensive process to obtain the land and necessary authority to construct a new microwave station. The addition of intermediate hops also jeopardizes reliability because it introduces an entirely new link in the communications chain and increases the likelihood of malfunction.

Apart from the need for intermediate stations, the operational and financial costs of changing-out a 2 GHz microwave system to a 6 GHz system are restrictive. The majority of new microwave equipment is digital, rather than analog, with a continuing trend of reduced availability of manufacturers and support for analog microwave systems. It is difficult and expensive to convert from existing analog systems to digital on a per hop basis. For example, phase-comparison (an extremely time-

critical utility function) is complicated if a digital path, is inserted in the middle of an analog system.

Digital equipment is more expensive than analog equipment and the conversion to its use often will result in more modifications to the system--and additional expense. Equipment costs for 2 GHz radios are about $30,000, compared to $60,000 for a 6 GHz digital radio. Grid antennas are used for 2 GHz systems, while 6 GHz systems require heavier, more expensive parabola antennas. In addition, 6 GHz systems in urban areas could require use of expensive Grade A or ultra high performance (UHX) antennas, an expense currently not needed for existing operations at 2 GHz. Other factors associated with a change-out to a higher frequency band include: (1) the expense of building or reinforcing towers on which to mount larger antennas, since existing communications towers are often fully loaded, and (2) the possible need to completely shut down a microwave system. Where microwave is used for teleprotection, for example, it would also be necessary to shut-down the high voltage transmission lines for which the microwave system provides protection during the conversion or to essentially place a new system in parallel operation prior to converting critical traffic to the new system.

3. <u>The Common Carrier Microwave Bands Are Not Suitable As Presently Configured for Most Private Microwave Systems</u>

In addition to the reliability problems associated with relocating the existing 2 GHz users to higher microwave bands, there are also several problems with the technical and operational characteristics of these bands as presently configured. The vast majority of the spectrum that the Commission cites as being the primary relocation bands for displaced 2 GHz users is allocated to common carrier services, and as such, is not suitable replacement spectrum, as presently configured, for the more than 22,000 private microwave facilities currently licensed in the 2 GHz band. In addition, looking at only the spectrum in the higher microwave bands that is currently available for private operations, it is apparent that the existing private microwave allocations are insufficient to accommodate all of the 2 GHz private microwave users. The FCC's OET Study itself, implicitly acknowledges this fact by not distinguishing between bands allocated for common carrier and private microwave services.

Moreover, the OET Study did not take the channel bandwidths or other technical characteristics of the higher frequency bands into consideration when it determined the level of available spectrum. The OET Study acknowledges that --

> The specific aspects of individual facility operations, such as actual channel bandwidths, were not considered. However, the operational characteristics of the 4 and 6

> GHz services are generally comparable to, or more extensive than, the operational characteristics of the 2 GHz band.[44]

That the "operational characteristics" of the higher bands are "more extensive than the operational characteristics of the 2 GHz band" is one of the fundamental problems not addressed by either the OET Study or the Commission's proposals in the NPRM. For example, the higher bands that are currently available for private microwave operations do not contain an adequate number of narrowband channel pairs to accommodate the 13,000 existing 2 GHz "skinny route" stations.[45] The 2.13-2.15 and 2.18-2.20 GHz private microwave bands are channelized into 24 pairs of 800 kHz, or 11 pairs of 1600 kHz, channels. By contrast, the 6.525-6.875 GHz private microwave band is channelized to provide only 5 pairs of 800 kHz channels, or 3 pairs of 1600 kHz channels.[46] Thus, as presently configured, the 6 GHz private microwave band would probably be able to accommodate only about one-fourth of the 13,000 "skinny route" private microwave stations in the 2 GHz band. The remaining channels in the 6 GHz private microwave band are 5 or 10 MHz wide, and assignment of these channels for low density operations would constitute gross mismanagement of the

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[44] OET/TS 91-1, p. 12, n.19.

[45] The "skinny route" is the 2.10-2.20 GHz portion of the 2 GHz band.

[46] Compare 47 C.F.R. §94.65(c) with §94.65(g).

spectrum. Likewise, the common carrier 4 and 6 GHz bands are channelized for generally 20 or 30 MHz bandwidths.[47]

In addition to incompatible channelization, the channel loading requirements for the 4 and 6 GHz common carrier bands are such that most private microwave systems, including "wideband" operations in the 1850-1990 MHz band, would be ineligible for relocation to these channels. Section 21.710 of the Commission's Rules provides that in the 3.7-4.2 and 5.925-6.425 GHz bands, licensees must load to a minimum of 900 voice-grade channels (4 kHz or equivalent) within 5 years, or operate at a minimum data rate of 10 Mb/s. Similarly, Section 21.122(a)(2), provides that digital systems in these bands must achieve at least 1152 encoded voice channels, which minimum may be reduced by a proportionate decrease in bandwidth. However, given the requirement of Section 21.710(c) for a minimum data rate of 10 Mb/s, as a practical matter licensees are limited to using at least 3.3 MHz bandwidth in the 4 GHz common carrier band or 5 MHz bandwidth in the 6 GHz common carrier band.[48]

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[47] See OET/TS 91-1, Table 2, p. 14.

[48] Section 21.122(a)(3) provides that the number of voice channels may be reduced by 1/N provided N transmitters may be operated satisfactorily within an authorized bandwidth equal to or less than the maximum authorized bandwidth over the same radio path. Thus, for example, with a maximum 20 MHz bandwidth for transmitters in the 4 GHz band, if bandwidth is reduced by a factor of 6 (to 3.3 MHz), the minimum channel capacity could likewise be reduced to 1152/6, or 192 channels. This bandwidth would accommodate 8 DS-1's, or a bit rate of 12 Mb/s.

Further, because of the proliferation of satellite earth receive stations in the 3.7-4.2 GHz band, both licensed and unlicensed, as a practical matter its is doubtful whether this band as presently configured will be able to absorb any of the displaced 2 GHz operations. Although the OET Study makes casual reference to use of this band for satellite reception, the study makes no attempt to quantify the number of licensed or unlicensed earth stations operating in the band, nor does it assess the impact of these receivers on the licensing of additional fixed microwave stations.[49/]

With approximately 29,000 private and common carrier stations in the 2 GHz band potentially affected by the FCC's spectrum reserve process, it is incumbent upon the Commission to develop specific rules to accommodate both the technical, as well as the legal eligibility, requirements of any displaced 2 GHz systems, and to provide spectrum for new private microwave systems. As adopted, the NPRM in Docket 92-9 does not propose to change any of the technical rules or coordination procedures for any of the bands proposed to be "made available" for displaced 2

[49/] See, e.g., FCC OET/TS 91-1, at Table 2, p.14: "3700-4200 MHz band -- Non-protected Home TV dishes. No replacement service on other bands." See, also, p. 17, n.26: "Satellite and [Fixed Service] facilities are co-primary in each of these [4 and 6 GHz bands]. The 3.7-4.2 GHz band is designated as a space-to-earth band where receive only earth stations operate. The majority of home TV satellite receivers operate in this band. The 5.925-6.425 GHz band is designated as a earth to space band or satellite up link." [sic].

GHz microwave systems, nor does it even request comment on or suggestions for changes in relevant technical rules. In fact, the NPRM proposes that users accessing any of this spectrum through "blanket" rule waiver would be required to abide by the technical rules and coordination procedures currently applicable to each of the higher frequency bands. In view of the number and potential complexity of the rule waivers which would be required to accommodate the similarly-situated 2 GHz licensees, the Commission should proceed with further rulemaking on this preliminary issue.

Finally, the Commission's proposal to waive the eligibility requirements for private microwave access to the common carrier microwave bands above 3 GHz does not address the issue of interference standards between common carrier and private microwave systems. The current common carrier microwave interference standards do not provide the degree of protection that many public safety/public service microwave systems require. Thus, absent development of more stringent interference standards, many 2 GHz private microwave users would suffer a degradation in their overall level of communications reliability if forced to relocate to a common carrier microwave band.

4. Fiber Optics Is Not A Suitable Replacement For 2 GHz Microwave

In a footnote to the NPRM, the Commission states that it encourages 2 GHz microwave users to consider the use of fiber optics to meet their telecommunications needs. While many utilities employ fiber optic technology in their telecommunications systems, UTC does not view fiber as a viable alternative to utility use of the 2 GHz band. Ideally, fiber should be considered as a supplement to existing microwave systems. The choice of telecommunications technology should be dictated by numerous site specific considerations to be reviewed when a choice between installing fiber optic telecommunications facilities or microwave facilities is made.

At least three factors can be cited against use of fiber optics as a wholesale replacement for 2 GHz microwave; availability of right-of-way, reliability, and cost.

To install a fiber optic system, continuous right-of-way must be obtained between all points on the system. While microwave systems operate line-of-sight, fiber optic systems are limited to whatever paths are available. Interstate highways, rivers, lakes, mountains, protected lands, or restrictive easements can prevent the construction of a viable fiber optic system or at least drive up construction costs. In urban areas,

underground ducts or overhead poles would be needed, but might not be available for fiber system construction.

Although fiber is highly reliable from the standpoint of its bit error rate, the reliability of a communications system must also take into consideration how secure the system is to outside forces and how long it takes to restore service in the event of disruption. UTC's members have reported positively with respect to the resiliency of their fiber optic systems during natural disasters, including hurricanes and earthquakes. However, fiber cuts, such as those caused by backhoe digging, are not uncommon, and will result in complete loss of service if the system does not have redundancy. For a fiber optic system, redundancy can only be achieved through a "looped" architecture and geographically alternate routing. Microwave systems, on the other hand, can achieve redundancy through the addition of "hot standby" radios and back-up power supplies.

As the Commission should be aware from recent outages of public telecommunications networks caused by fiber cuts, outage times can be significant, and could be upwards of 8 hours.[50/] Because utilities install communications systems to support time-critical telemetry and switching functions, outages of more than a few seconds at a time are unacceptable. Electric utilities,

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[50/] One major market utility has reported outages on its urban fiber optic system lasting between 24 and 36 hours.

for example, employ private microwave systems to support teleprotection systems designed to detect, isolate, and clear fault conditions on high power electric transmission lines within a matter of milliseconds. Because faults are most likely to occur during storms, it is critical that the teleprotection system remain functional throughout even the worst weather conditions.[51/] Considering the speed with which electricity flows, and the high voltages and currents involved, outages on teleprotection systems cannot be tolerated. To provide the redundancy needed to assure uninterrupted communications, a fiber optic system would have to be installed in a looped configuration so that a single fiber cut would not create an extended outage.

Another recently experienced technical problem arguing against the replacement of microwave with fiber has been discovered. In many utilities, analog microwave is required to link land mobile simulcast transceiver sites to obtain the needed wide area coverage for normal dispatch and disaster recovery communications. Due to phasing tolerances required by simulcast transceiver sites (rubidium standards are used for synchronizing), transmission path delays must be factored into

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[51/] An analogy has been drawn between the importance of teleprotection systems to the electric power grid and the importance of brakes and windshield wipers to driving an automobile: while a person might tolerate his brakes or wipers failing 1% of the time, he would not tolerate it if his brakes or wipers tend to fail only when it rains. In this case, 99% availability is unacceptable.

system design. This compensation is passive in nature, and is accomplished through delay blocks. Fiber optic cable has a temperature reaction such that a temperature excursion between 40 degrees F and 70 degrees F results in a change in the fiber's index of refraction, which causes a change in the effective transmission path distance of 1.8 meters per every 10 kilometers of fiber optic cable.[52/] This variation causes sufficient phasing differences between simulcast base station sites to garble and make unintelligible the transmitted simulcast voice communications. In order to solve this problem, the mobile radio system and its associated transceivers would have to be converted to digital technology, along with the conversion to digital fiber technology. At present, analog fiber systems are typically used as entry links into analog microwave systems for obvious economic reasons. The conversion to digital of the mobile radio system would add millions (depending on the size of the land mobile system) to the cost of replacing 2 GHz analog microwave with fiber optics.

Finally, the cost of fiber optics cannot be ignored. While construction costs vary widely among regions of the country, the type of installation (overhead or underground), and the number of fibers installed, costs generally fall in the range of $30,000 -

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[52/] Appended hereto as Attachment B is a report from Corning Incorporated, a major supplier of fiber optic cable, which explains this phenomenon.

$50,000 per mile.[53] It is important to note that these estimates assume the availability of right-of-way and/or electric transmission towers or poles for installation of the fiber. While microwave systems utilize the shortest distance between two points, fiber paths are limited to what the specific topography allows, and thus, the cost to install fiber can be prohibitive. Urban areas present additional problems, since many of the utility poles have multiple users and are filled to capacity with power, telephone or cable television wires, and the addition of fiber would require the utility to upgrade the poles and rearrange the existing users at additional expense. Even with electric transmission towers, the addition of optical ground wire might increase tower loading beyond acceptable limits due to ice and wind loading design criteria.

Further, in estimating the cost to replace a microwave system with fiber, it is not simply a matter of multiplying the microwave path distance by the per-mile cost estimate. Because of the need to have a looped system with geographically alternate routing, the fiber mileage will be more than twice the microwave path distance.

When the example of even a 15-mile microwave path is considered, it is easy to see that the cost of fiber optics would

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[53] One major market utility has reported its urban fiber construction costs at between $80,000 - $100,000 per mile.

be prohibitive for most situations. Assuming the availability of right-of-way reasonably close to the microwave path, and adding only 1 mile to the overall route length to compensate for alternate routing, a looped fiber optic system (with 31 route miles) would cost between $930,000 and $1,550,000. With the tens of thousands of microwave paths extant in the 2 GHz band, the costs to relocate these paths to fiber optics would be in the tens of billions of dollars.[54/]

In conjunction with any spectrum-sharing or reallocation proposal, the Commission should move to preempt state regulation of private carrier fiber optic communications systems. As noted above, fiber optic systems are a possible solution to frequency congestion in the microwave bands, but are not suitable for all applications. To the extent cost is the only barrier to the use

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[54/] One of UTC's member companies has estimated that to replace its existing 1.8-2.2 GHz microwave system with fiber optics, it would need to install 1,450 miles of fiber. At its estimated $31,500 per-mile cost to install fiber, this utility estimates its total cost would be $45,675,000, and that the project would take about 4-5 years. It should be noted that to build redundancy into this system by installing a loop configuration, the $45.7 million estimate would have to be more than doubled.

Another utility, operating an extensive 2 GHz microwave system throughout its service territory, has estimated that the cost to replace its microwave system with fiber would be in the ballpark of $175 million. Assuming it could install 175 miles of fiber per year, it would take this utility 20 years to complete the transition, assuming the funds are available and could be budgeted for such a project. The utility has noted that the cost to construct 175 miles of fiber would be about six times greater than its current annual communications capital budget.

of fiber in lieu of fixed microwave, federal preemption would help promote the use of fiber by permitting the owner of the fiber system to lease its reserve or excess fiber capacity.

In PR Docket No. 83-426,[55] the Commission preempted state regulation of private carrier microwave systems as a means of encouraging the more efficient use of scarce microwave spectrum. On reconsideration in that docket, the Commission went further and preempted state regulation of "hybrid" fiber/microwave systems on the same basis.

In NorLight,[56] the Commission preempted state regulation of an interstate private carrier fiber optic system. The Commission noted that use of fiber optics lessened the demand for scarce microwave spectrum, and encouraged the development of private carrier fiber systems. In Public Service Co. of Oklahoma, the Commission preempted an intrastate "hybrid" fiber/microwave system on essentially the same basis.[57]

Unfortunately, the Commission has not taken action to preempt state regulation of "pure fiber" intrastate private

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[55] First Report and Order in PR Docket No. 83-426, 50 Fed. Reg. 13,338 (April 4, 1985).

[56] Norlight, Declaratory Ruling, 2 FCC Rcd 132, aff'd, FCC 87-240 (1987).

[57] Public Service Company of Oklahoma, 3 FCC Rcd 2327 (1988).

carrier systems. The private microwave systems of most utilities operate wholly intrastate. Many of these utilities have foregone the idea of constructing private carrier fiber optic systems due to threat of state regulation. If the Commission acts to further deplete the amount of microwave spectrum available to private users, it must also act to preempt state regulation which would interfere with users' ability to make most efficient use of alternate, non-spectrum dependent technology.

5. Tax Certificates

In connection with encouraging migration from the 2 GHz band, the Commission requests comment on whether it should award tax certificates to fixed microwave licensees who receive financial compensation from an entity seeking to use the spectrum for new technology as part of an agreement to surrender their license and use other, non-radio alternative media.

As a preliminary matter, UTC questions whether the Commission has the authority under the existing statutes to grant tax certificates to displaced 2 GHz microwave users. Section 1071 of the Internal Revenue Code explicitly grants authority to the Commission to grant tax certificates in conjunction with the ownership or control of "radio broadcasting "stations." This

section does not imply a general authority to the Commission to issue certificates regarding all communications services.[58]

The Commission points to Telocator Network of America, 58 RR 2d 1443 (1985) as a precedent for expanding the applicability of Section 1071 beyond transactions involving broadcast facilities. In Telocator, the Commission determined that it could issue tax certificates in connection with the sale or exchange of non-wireline cellular partnership interests in cellular markets. In reaching its decision, the Commission was guided by the legislative history to Section 1071. The Commission found that the "principle goal of the provision is to facilitate the promotion of a competitive market structure," and determined that "[c]onsideration of the dramatic and substantial changes that have taken place in telecommunications since the language of 1071 was first enacted argues in favor of expansively construing the phrase radio broadcasting to facilitate the effectuation of the Commission's procompetitive policies in segments of the telecommunications market other than broadcasting."[59]

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[58] Section 1071 of the Internal Revenue Code would arguably be more applicable to transactions involving replacement of wireless cable facilities in the 2.5 GHz band and broadcast auxiliary facilities in the 1.99-2.11 GHz band, as these bands are used to provide services that are similar or connected with broadcasting.

[59] Telocator Network of America, 58 RR 2d at 1448.

The holding in Telocator therefore appears to be limited to the granting of tax certificates to foster competition between identical or similar telecommunications services. The spectrum reserve proceeding involves the replacement of an existing type of telecommunications service with an entirely new and different type of service.

If, however, the Commission is deemed to have authority to issue tax certificates for transactions involving non-broadcast communications, the availability of such certificates should not be limited to transactions involving non-radio alternative media such as fiber optics, but should be equally available for transactions involving a shift to other radio frequencies. It should be noted, however, that tax certificates would be of limited benefit to existing users of the 2 GHz band. For example, tax certificates would not benefit public power utilities or other state and local government agencies since these entities do not pay tax. Further, the primary effect of tax certificates would be to benefit new technology licensees by permitting them to offer less consideration to tax-paying licensees than they might otherwise have to pay.

6. Federal Government Spectrum

In the NPRM, the Commission requested comment on the "feasibility" of making available a portion of the 1.71-1.85 GHz

federal government spectrum for relocation of existing 2 GHz operations.[60] However, the Commission conceded that the OET Study did not examine spectrum allocated to the federal government "because of the delay and uncertainty that would be involved in obtaining reallocation of such spectrum not under [the FCC's] jurisdiction." The Commission claims to have raised the issue of using the 1.71-1.85 GHz band "in a preliminary fashion" with the National Telecommunications and Information Administration (NTIA), but the NPRM offers no specific proposals for the reallocation of this spectrum for non-federal users.

UTC realizes that the 1.71-1.85 GHz band is currently allocated exclusively to the Federal government. However, there is no restriction on the FCC's ability to enter into negotiations with NTIA regarding sharing of this band. The allocation of the 932-935 MHz and 941-944 MHz bands for Federal government and non-Federal government fixed use is a recent example of such a sharing arrangement.[61]

Relocation of displaced 2 GHz microwave users to the 1.71-1.85 GHz band would cause the least disruption to on-going 2 GHz operations, since the propagation characteristics of both bands are nearly identical. Moreover, the cost of such a relocation

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[60] NPRM in ET Docket No. 92-9, at para. 21.

[61] See First Report and Order in GEN. Docket No. 82-243, 50 Fed. Reg. 4650 (1985).

would be substantially less than a shift to a higher band. UTC estimates that the cost to convert from 1.85-2.20 GHz to 1.71-1.85 GHz would be approximately $10,000 per station, assuming the licensee can tolerate the minimum 1-2 day downtime to perform the necessary equipment modifications and assuming that the new channel bandwidth at 1.71-1.85 GHz is equivalent to the licensee's current bandwidth.[62/] The costs would increase to about $21,000-$32,000 per station if the licensee must convert from a narrowband operation to a wideband operation.

Obviously, any shared use of this band with the Federal government would have to ensure that the Federal users of the band experience no interference to their existing operations. However, this should not be a problem since one of the primary uses made of this band by the Federal government is point-to-point microwave. Such shared use was specifically recommended by the House Committee on Energy and Commerce in its Report on H.R. 531, the Emerging Telecommunications Technologies Act of 1991:

> The Committee notes that currently, NTIA and the FCC each administer adjacent blocks of frequencies for the same or similar purposes. For example, NTIA has licensed government fixed microwave users to utilize frequencies between 1710 mHz and 1850 mHz. The FCC licenses non-federal fixed microwave users on frequencies between 1850 mHz and 1990 mHz. Maintaining separate blocks of frequencies for fixed microwave services constitutes an inefficient approach to spectrum management. That inefficiency is particularly

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[62/] If a licensee cannot tolerate an extended outage the cost would be approximately $75,000 per station for narrowband equipment.

> egregious in this instance, inasmuch as it is relatively easy to engineer fixed microwave networks -- of both federal and non-federal users -- so as to avoid harmful interference.[63]

In a just-released Spectrum Resource Assessment (SRA), NTIA has provided further information confirming the suitability of the 1.71-1.85 GHz band for shared use by private microwave systems.[64] The SRA reveals that of the 5,539 frequency assignments currently listed in the Government Master File (GMF) for the 1.71-1.85 GHz band, about 4,840 (87%) are in the fixed service for point-to-point, line-of-sight, operations.[65] Significantly, the equipment used in this band for fixed operations is largely commercial equipment purchased off-the-shelf which can be crystal tuned to any frequency across the 1.7-2.4 GHz band.[66] Indeed NTIA's technical standards for fixed systems in the 1.71-1.85 GHz band are virtually identical to the FCC's standards for private microwave systems in the 1.85-1.99 GHz band.[67]

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[63] H.R. Rep. No. 102-113, 102d Cong. 1st Sess. 16 (1991).

[64] Federal Spectrum Usage of the 1710-1850 and 2200-2290 MHz Bands, NTIA TR 92-285 (March 1992).

[65] Id. p. 4-3.

[66] Id., p. 5-22.

[67] Compare NTIA TR 92-285 Tables 3-6 with 47 C.F.R. §§94.71 and 94.75.

Further, the NTIA SRA indicates that federal agencies are making use of the 1.71-1.85 GHz band for the same types of operations as private microwave users in the 1.85-2.20 GHz band. For example, the SRA describes how the Department of Energy (DOE) uses the band for supervision, control, and protection of power administration operated electrical power transmission systems, and that these microwave systems must be capable of carrying hundreds of radio channels per system for high speed relaying, supervisory control, load control, telemetering, data acquisition, land-mobile dispatching, operations and maintenance -- in short, the same functions routinely supported by the 1.85-2.20 GHz band for private sector utilities. The SRA further notes that, "Common equipment exists with the non-government sector allowing interconnectivity for critical communications dealing with all aspects of generating and distributing power."[68] Despite the SRA's apparent contention that this band is heavily congested, it should be noted that the 1.85-1.99 GHz private microwave band contains nearly twice the number of fixed point-to-point frequency assignments as the 1.71-1.85 GHz band (9,258 vs. 5,539).[69]

NTIA itself has suggested elimination of the distinction between federal and non-federal microwave allocations since in

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[68] NTIA TR 92-285, at pp. 4-1, 4-2.

[69] The station count for the 1.85-1.99 GHz band is taken from the OET Study, OET/TS 91-1, p.8.

the microwave bands, coordination procedures are well established and the affected equipment has well-known technical characteristics.[70] Likewise, at a March 26, 1992, meeting among the FCC staff and private microwave users, and in a April 20, 1992 letter to Senator Ernest Hollings the Commission stated that it would commence discussions with NTIA concerning private access to the 1.71-1.85 GHz band.

In addition to the 1.71-1.85 GHz band, UTC urges that the Commission's negotiations with NTIA include a portion of the 3.6-3.7 GHz band as possible replacement spectrum for displaced 2 GHz users. The 3.6-3.7 GHz band is currently allocated for use on a shared basis by both the Federal government and non-Federal government users. It is UTC's understanding that this band is not heavily loaded and would provide propagation characteristics that are superior to the 6 GHz microwave band.

III. FCC's Transition Plan

In describing its relocation plan for existing 2 GHz microwave users, the Commission claims that its proposed approach is in sharp contrast to the "band clearing" approach that it utilized to relocate the two full service UHF television stations and a handful of TV translators from the 800/900 MHz band in

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[70] U.S. Spectrum Management Policy: Agenda for the Future, NTIA Special Publication 91-23 (February 1991), at p. 67 n.200.

order to reallocate that band to the land mobile services.[71] UTC agrees there is a difference: the band clearing that the Commission is now proposing is a much more drastic form of band clearing in that the Commission is proposing to displace over 29,000 microwave stations that are heavily relied upon by the nation's core industries and public safety organizations.

Throughout the NPRM, the Commission repeatedly uses the terms "minimize" or "mitigate" to describe the effect it hopes its proposed relocation plan will have on private microwave systems. What the FCC fails to understand is that "minimizing" the impact on critical utility microwave systems is not enough: the Commission must "protect" these systems if it is to serve the public interest, convenience and necessity.

A. De Facto Freeze Should Be Lifted

As part of its transition plan, the Commission has implemented a policy whereby applications for new 2 GHz microwave facilities received after January 16, 1992, would only be granted on a conditional secondary basis pending the outcome of the spectrum reserve rulemaking. In view of the critical functions supported by their private microwave systems, utilities are unwilling to operate microwave systems on a "secondary-only"

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[71] NPRM, at para. 22.

basis. Therefore, the practical effect of the Commission's 2 GHz licensing policy has been to foreclose licensing of new 2 GHz microwave systems as well as the expansion or modification of existing 2 GHz microwave systems.[72/]

On May 14, 1992, the Commission issued a Public Notice clarifying its conditional secondary licensing policy for 2 GHz microwave applications received after January 16, 1992, as it applies to the treatment of applications for modifications and expansions of existing microwave systems. The Public Notice clarifies that: (1) the conditional secondary status will not apply to modifications of facilities licensed prior to January 16, 1992; and (2) the conditional secondary status will not apply to applications for reasonable system expansions if the applicant makes a valid showing of its need for the new facilities and/or frequencies.

UTC applauds this action on the part of the Commission as a step in the right direction. UTC now, however, urges the Commission to go further and lift the "freeze" entirely. As described below, UTC supports allowing new microwave systems to be licensed in the 2 GHz band on an indefinite co-primary basis.

[72/] Among UTC's members are state- and municipally-owned electric, gas and water utilities which are equally precluded from modifying or expanding existing systems, and from installing new 2 GHz microwave systems, despite the Commission's proposal to afford indefinite co-primary status for these entities' existing 2 GHz microwave systems.

Since the specific technologies that will share this band have not been identified, there is no reason to foreclose additional use of this band for fixed microwave. However, without primary status, new microwave systems will not be built in the 2 GHz band.

B. Co-Primary is Unworkable Without Interference Criteria

The second proposal of the Commission's transition plan is to allow existing 2 GHz microwave licensees to remain in the band on a co-primary basis with new services for a fixed period of time, such as ten or fifteen years. After the initial transition period has elapsed, these systems could continue to operate in the band on a secondary basis.

As a preliminary matter, UTC notes that the Commission has failed to define co-primary licensing status. The Commission should define co-primary licensing status as first-in-time, first-in-right status that would ensure that the operations of the first licensee on a given frequency in a given geographic area are protected from interference. The granting of co-primary status should be extended to new 2 GHz microwave systems that have a legitimate need to operate in the 2 GHz band. Licensing would be similar to the present situation in the 4 and 6 GHz common carrier bands which are presently available for licensing to both satellite and microwave operations on a co-primary basis.