channels without site-specific Commission approval. Different rules may be needed, however, for the J and **K** channels to ensure protection to adjacent-channel MBS operations. To the extent that site-specific licenses are currently issued for the LBS, **UBS** and I channels, post-transition those licenses should be superceded by new geographic area licenses. Of course, existing and new facilities outside the MBS will have to comply with a variety of new Commission rules designed to control interference (including the limits on signal levels outside the **GSA** and spectral masks discussed *infra* in Section IV.A.2), as well as the current Part 17 antenna support structure rules and the RF emission limits under Parts 1 and 2.[51] In addition, consistent with the Commission's decisions in similar situations, individual station licensing should still be required where individual environmental assessments are required under Sections 1.1301 through 1.1319 of the Rules, international coordination is required, or where the facilities will operate in the quiet zones listed in Section 1.924 of the Rules.[52]

Under the WCA/NIA/CTN proposal, every MDS and ITFS licensee will obtain a **GSA** automatically upon the effective date of the new rules ("New Bandplan Rules Effective Date").[53] That GSA will serve the function of the current protected service area until the license is transitioned to the new bandplan. After the transition, the **GSA** will serve as the area in which operations can occur in the non-MBS bands without site-specific authorization and as the functional equivalent of the current protected service area for MBS operations.

In the case of an MDS BTA authorization holder, the boundaries of the **GSA** will be exactly the same as its current protected service area under Section 21.933(a). In the case of an incumbent MDS licensee or an **ITFS** licensee, its **GSA** will be based upon its current protected service area under Section 21.902(d) or 74.903(d) of the Commission's rules. However, due to changes over the past twenty years in the protected service area rules, protected service areas assigned cochannel incumbent MDS and ITFS licensees often overlap and, as a result, cannot be used as exclusive GSAs without the modifications described below.

The protected service area concept was first introduced by the Commission in 1984. The initial protected service area generally was a 15-mile radius circle that was afforded only to MDS licensees and to ITFS licensees leasing excess capacity – ITFS licensees not leasing excess

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[51] To implement this proposal as it relates to RF emissions, the Commission's rules relating to RF emissions from mobile and portable devices -- Sections 1.1307(b)(2), 2.1091(c) and 2.1093(c) -- should be amended to include MDS and ITFS among the services to which the rules apply.

[52] ***See*** *e.g.*, ***27 MHz R&O***, 17 FCC Rcd at 10015

[53] **In** its ***Notice*** *of Proposed Rulemaking* in WT Docket No. 02-68, the Commission has proposed to establish a BTA-like area in the **Gulf** of Mexico for MDS licensing. Under that proposal, tho boundary between the land-based BTA's and the **Gulf** BTA-like area would he identical to that provided for WCA at **2.3** GHz – at the limit of the United States' temtorial waters in the Gulf (which is approximately 12 nautical miles from the coastline). ***See*** *Amendment* ***of*** *Parts 21* ***and*** *74 of* ***the*** *Commission's Rules* ***With Regarding to Licensing in the Multipoint Distribution Service and*** *in the Instructional* ***Television Fixed Service for*** *the* ***Gulf of Mexico,*** 17 FCC Rcd 8446 (2002). **In** comments filed earlier this week, WCA expressed support for that proposal, so long as it is clear that the **Gulf** BTA-like area does not include areas within the protected service areas of incumbent MDS and ITFS stations along the Gulf. ***See*** Comments of Wireless Communications Ass'n Int'l, WT Docket No. 02-68, at 6-7 (filed Oct. 1, 2002). NIA and CTN endorse WCA's position.

capacity were entitled to protection solely at their registered receive sites.[54] In some cases, closely-spaced stations previously had been licensed under the pre-1984 rules, resulting in overlaps when the new 15-mile radius protected service area circles were drawn. Pre-existing interference within those overlap areas was grandfathered by the Commission.[55] The overlap problem was compounded in 1995, when the Commission responded to years of evidence that MDS and ITFS stations were capable of serving far beyond 15 miles and expanded the protected service area to a 35-mile radius circle.[56] Again, the Commission recognized that its action would result in even more overlapping protected service areas and adopted appropriate grandfathering policies.[57] Three years later, the *MDS/ITFS Two-Way* ***Report and Order*** in **MM** Docket No. 97-217 further exacerbated the problem by affording a protected service area for the first time to ITFS licensees not engaged in leasing.[58]

The Commission's MDS/ITFS interference protection rules, when applied to these overlap areas, have had the unintended consequence of creating "no man's land" – neither licensee can satisfy the cochannel interference protection benchmark and thus neither can serve the overlap area. Over the years, the industry has informally developed a variety of mechanisms to allow some service within the overlap areas. The most prevalent of these has become known as "splitting the football" – a term used for bifurcating the overlap area so that each licensee will have exclusive rights to **a** portion. WCA, **NIA** and **CTN** are proposing that the Commission codify industry practice and provide that overlapping protected service areas will be divided so that each licensee will have exclusive access to a portion of the overlap area. Because the process of "splitting the football" can become somewhat complex when more than two protected service areas overlap, specific rules for dividing the overlap areas are set forth in Appendix A.

It is recognized that the process of splitting overlap areas may result in situations where certain **ITFS** receive sites that are within the current protected service area of an ITFS station fall

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[54] In **cases where directional transmission antennas were employed, the shape** of **the protected service area was initially adjusted to mirror the antenna pattern, although** it **remained the same size.** ***Amendmenl of Parts 21, 74 and 94 of the Commission Rules and Regulations with Regard to the Technical Requirements Applicable to the Multipoint Distribution Service, the Instructional Television Fixed Service and the Privale Operational-Fixed Microwave Service (OFS),*** 98 **FCC** 2d 68, 87-113 (1984)["*Docket 80-113 R&O*"]. In 1989, **the Commission** effectively **repealed the provision** of **a protected service area to leasing ITFS stations in** ***Sherburne Wright Educational Technology Cooperalive,*** 4 **FCC** Rcd 4076, 4077-78 (1989). **That decision was itself** overturned **two** years **later** when the **Commission reversed course and agreed that ITFS licensees leasing excess capacity should be entitled to a protected service area.** ***Amendmenl of Parts 21, 43, 74, 78 And 94 of the Commission's Rules Governing Use of the Frequencies in the 2.1 and 2.5 GHz Bands Affecting: Private Operational-Fixed Microwave Service, Multipoint Distribution Service, Mullichonnel Multipoint Distribution Service, Instructional Television Fixed Service & Cable Television Relay Service,*** 69 **RR 2d** 1477, 1482 (1991).

[55] ***See id.*** **at** 111-12.

[56] ***In the Matter of Amendment of Parts 21, 43, 74, 78, and Y4 of the Commission's Rules Governing Use of the Frequencies in the 2.1 and 2.5 GHz Bands Affecting Privale Operalional Fixed Microwave Service, Multipoint Distribution Service, Instructional Television Fixed Service & Cable Television Relay Service,*** 10 **FCC** Rcd 7074, 7082 (1995).

[57] ***See id.*** **at** 7082-7085.

[58] *MDS/ITFS Two-Way Report and Order*, 13 **FCC Rcdat** 19172-73.

outside the new GSA.[59] It is contemplated that service to those receive sites continue and that those receive sites he entitled to ongoing interference protection, as is discussed in more detail ***infra*** in Section 1V.B.2. Along similar lines, it is recognized that stations that are operating today in compliance with the **-73** dBW/m² power **flux** density limit at their protected service area boundary may exceed that level at the GSA boundary when new GSA boundaries are drawn to reflect the elimination of overlaps. Although facilities in the non-MBS channels should be required to comply at their GSA boundary with the new signal strength restrictions imposed to limit cochannel interference as soon as transitioned pursuant to Appendix B, in the MBS current signal levels should be grandfathered.[60] More specifically, licensees of MBS channels that exceed the GSA boundary limit as of the New Bandplan Rules Effective Date should be permitted to continue operating and to make modifications that continue to exceed the new limit, so long as the modifications do not result in any increase in the grandfathered signal strength at any point outside the GSA.

## IV. THE LICENSING, TECHNICAL AND INTERFERENCE PROTECTION RULES

As discussed above, one of the principal objectives of the instant proposal **is** to provide licensing, technical and operational rules appropriate to each segment of the new handplan. In the discussion that follows, WCA, NIA and CTN will address specific regulatory policies for each of the hands. In addition, they contemplate that MDS and ITFS licensees in all of the various segments also will be subject to a variety of other Commission rules, including Part 15 equipment authorization, Part 1 and *2* RF exposure rules and Part 17 antenna structure rules.

WCA, NIA and CTN are in agreement that (i) operations in the Transition Bands (the J and **K** channels) must be secondary to operations in the LBS, MBS and UBS (*i.e.* absent agreement otherwise, they may not cause any interference and they must accept any interference), and (ii) adequate safeguards must be put into place to ensure that operations in the MBS band are protected from harmful adjacent-channel interference caused by operations in the Transition Bands. While the parties have been unable to agree upon appropriate licensing and operating rules to govern those channels, they are continuing to explore various options, and will report to the Commission as progress is made.

### *A. The Rules Applicable Outside The MBS*

In its 1999 ***Policy Statement*** regarding the encouragement of emerging telecommunications technologies, the Commission recognized that there are substantial public interest benefits to harmonizing the rules applicable to like services. Specifically, the Commission found that "[h]armonization provides regulatory neutrality to help establish a level playing field across

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[59] Receive sites that are more than 35 mile from the ITFS transmission site (*i.e.* outside the current protected service area) are **not** entitled to interference protection pursuant to Section 74.903(a)(5) of the Commission's Rules and will not be entitled protection under the instant proposal.

[60] There is ample precedent for grandfathering here. When the Commission first imposed the -73 dBW/m$^2$ power flux density at protected service area boundaries, it similarly grandfathered situations that did not comply with the new rule. See ***MDSBTA*** Auction Order. 10 FCC Rcd at 9618.

technologies and thereby foster more effective competition."[61] Subsequently, Chairman Powell has embraced that approach.[62] WCA, NIA and CTN certainly agree with that philosophy, and urge the Commission to apply it here. With the possible exception of the J and **K** bands (which as discussed above are still under discussion), WCA, NIA and CTN urge the Commission to adopt technical rules for the non-MBS MDS/ITFS spectrum in the 2.1 GHz[63] and 2.5 GHz bands that are similar to the Part 27 technical rules the Commission has recently applied to other flexible use services, such as the upper and lower 700 MHz band,[64] and the 1390-1392 MHz, 1392-1395 MHz, 1432-1435 MHz, 1670-1675 MHz, and 2385-2390 MHz bands.[65]

### *1. The Non-MBS Licensing Rules*

Consistent with the approach the Commission has taken with respect to other flexible use services, WCA, NIA and CTN suggest that MDS and ITFS licensees in the 2.1 GHz band, in the LBS and UBS, and on the I channels not be required to apply for Commission consent to construct and operate new facilities. Rather, like Part 27 licensees, MDS and ITFS licensees on LBS, UBS and I channels should be free to construct and operate facilities within their GSAs without site-specific approval, except in those cases where an environmental assessment is required pursuant to Sections 1.1301-1.319 of the Rules,[66] where required in connection with

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[61] ***Principles*** for ***Reallocation*** of ***Spectrum to Encourage the Development*** of ***Telecommunications Technologies for the New Millennium,*** 14 FCC Rcd 19868, 19871 (1999). ***See also Reallocation and Service Rules*** for ***the 698-746 MHz Spectrum Band (Television Channels 52-59),*** 17 FCC Rcd 1022, 1049 (2002)["*Lower 700 MHz R&O*"].

[62] ***See, e.g.,*** Opening Statement of Michael K. Powell before the Subcommittee on Telecommunications and the Internet of the House Committee on Energy and Commerce, at 2 (March 29, 2001)("We will rationalize and harmonize regulations across industry segments wherever we can and wherever the statute will allow.").

[63] WCA, NIA and CTN appreciate that the Commission presently has before it in ET Docket 00-258 various proposals for relocating MDS from the 2.1 GHz band (including one submitted by a coalition that includes WCA). For purposes of this proceeding, it makes sense to amend the rules applicable to MDS at 2.1 GHz to conform to those for the **LBS** and UBS. If the Commission subsequently decides in ET Docket No. 00-258 to relocate MDS to other spectrum, **it** can in that proceeding develop appropriate licensing and technical rules.

[64] ***See Service Rules*** for ***the 746-764 und 776-794 MHz Bands, and Revisions to*** Part ***27 of the Commission's Rules,*** 14 FCC Rcd 11006, 11012 (1999)["*Upper 700 MHz Band Service Rules NPRM*"]("Part 27 was originally developed with an architecture designed to accommodate flexible use"); ***Reallocation and Service Rules*** for ***the 698-746 MHz Spectrum Bund (Television Channels 52-59),*** 17 FCC Rcd 11613 (2002)("To complement this flexible allocation to new services on the Lower 700 MHz Band, we generally applied the Part 27 service rule framework to promote the efficient use of spectrum and permit service providers to select the technologies and services that the market may demand.").

[65] ***See 27 MHz R&O,*** 17 FCC Rcd at 9988 ("[W]e believe that the general application of our Part 27 licensing and operating rules will promote flexible and efficient use of the unpaired 1390-1392 MHz, 1670-1675 MHz, and 2385-2390 MHz bands and the paired 1392-1395 MHz and 1432-1435 MHz bands. We agree with the commenten that application of our **Part** 27 rules will provide licensees a streamlined licensing framework that will foster innovation, flexible use and regulatory certainty.").

[66] ***See*** **47** C.F.R. § 27.11(a)("Applications for individual sites are not required and will not be accepted, except where required for environmental assessments, in accordance with §§ 1.1301 through 1.1319 of this chapter."). ***See also*** 47 C.F.R. § 24.11 (In the personal communications services, "[b]lanket licenses are granted for each market and frequency block. Applications for individual sits are not required and will not be accepted.").

international coordination requirements,[67] or where the facilities will operate in the quiet zones listed in Section 1.924 of the Rules.[68] As noted above, some additional considerations must be taken into account with respect to operations within the J and K bands in order to protect adjacent channel MBS licensees.

As will be discussed in more detail in Sections IV.A.2.b)and IV.A.2.c), the development of rules designed to minimize interference among stations operating on the non-MBS channels is complicated by the desire of WCA, NIA and CTN for rules that permit the use of a variety of technologies, without having rules that are so protective of worst-case scenarios that they prove to be spectrally-inefficient. The philosophy underlying the regulatory approach being advocated in this white paper is that the interference-protection rules should generally impose limits based on the assumption that neighbors are using relatively compatible technologies, but should provide special procedures applicable where less compatible technologies are deployed in proximity to each other. As is discussed in more detail in those sections, WCA, NIA and CTN are exploring special procedures are designed to maximize each licensee's ability to provide service to its GSA, while also maximizing efficiency in spectrum usage. As is discussed in more detail in those sections, WCA, NIA and CTN are developing procedures tailored to the unique features of the MDS/ITFS band that will require close coordination of facilities in those situations where the risk of interference between licensees is high. Therefore, it is suggested that the Commission require every licensee of LBS, UBS and I channel spectrum to file an electronic notice with the Commission within five business days of activating a new base station. That notice should provide: (i) the coordinates **(in** NAD83) of the base station; (ii) the frequencies utilized by the base station for base-to-subscriber transmissions and for subscriber-to-base transmissions; and (iii) the height above ground level of the center of radiation for each transmission or reception antenna. Any subsequent changes to those parameters should also be reported to the Commission within five business days. The database created by these notices should be made available to other MDS and ITFS licensees, so that they can identify base stations that have to he considered in designing their own systems. In addition, within twenty-one days of request from a cochannel or adjacent channel license, a licensee of LBS, **UBS** and I channel spectrum should he required to provide for each antenna the antenna horizontal and vertical antenna patterns (including any electrical beam tilt), the EIRP in the direction of the main lobe (if a transmitting antenna), the orientation of the main lobe, and the orientation and angle of any mechanical beam tilt.

While WCA, NIA and CTN appreciate that this requirement has not been imposed on other flexible use services,[69] they believe that a Commission requirement for the free exchange of critical information will promote the most efficient use of the MDS/ITFS spectrum. MDS/ITFS has substantially more licensees in any given market than other flexible use services, sometimes more than a dozen. In addition, MDS/ITFS GSAs will be substantially smaller than

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[67] *See* **47 C.F.R.**§ 1.923(f).

[68] *See* 47 C.F.R. § 1.923(g). *See also 27 MHz R&O*, 17 FCC Rcd at **10015-16.**

[69] **The closest analogy is Section** 24.815(j), **which requires broadband PCS licensees to maintain a listing** of **station locations.**

the geographic areas licensed to other flexible use providers. All of this means that the task of coordinating MDS/ITFS operations in the non-MBS hands will require more intensive efforts on the part of licensees than in other services. As discussed below in Section IV.A.2.b), formal pre-construction coordination requirements along the lines of Section 101.103 of the Commission's rules are inappropriate here. While WCA, NIA and CTN anticipate that the vast majority of licensees will cooperate in informal information exchanges, there is concern that an uncooperative licensee in the vicinity of a given market could have a substantial adverse impact on the ability of MDS/ITFS to provide that market with broadband services. The proposed rule requiring notification filings will help assure that does not occur, while imposing only a minor burden on the Commission and licensees.

### *2. The Non-MBS Technical And Operational Rules*

Consistent with the approach the Commission has taken with a variety of other emerging services, WCA, NIA and CTN believe that the Commission should regulate the use of the LBS, UBS and I channel bands with a light touch. Again, they believe that the Commission's approach to the various new Part 27 services should serve as the model. In each of those cases, the Commission has primarily relied on signal strength limits at the service area border to control cochannel interference, spectral masks to control adjacent channel interference, and power limits to generally facilitate the provision of services and the interference-free coexistence of service providers.

a) Power Restrictions

As is discussed below in Section IV.A.2.b), it is proposed that the Commission limit cochannel interference through the adoption of a maximum signal strength measured at the border of each licensee's GSA. Because that signal strength limit will serve as the primary means of limiting cochannel interference in the non-MBS channels, the WCA Technical Task Group has concluded that there is no reason for the Commission to alter the current provisions of Sections 21.904(a) and (b) and 74.935(a) and (b) limiting the EIRP of MDS and ITFS stations."

However, it is recommended that the Commission repeal the restriction contained in Sections 21.909(g)(2) and 74.939(g)(2) limiting the transmitter output power of MDS/ITFS customer equipment to 2 watts. That restriction was adopted in the ***MDS/ITFS Two-Way Report and Order*** without any explanation whatsoever. It has proven to unduly restrict the flexibility of

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[70] WCA, NIA and CTN are recommending that the Commission eliminate the provisions of subsection (c) of the two rules with respect to operations outside the MBS. Those subsections limit the use of digital modulations with non-uniform spectral densities. They were adopted in connection with the Commission's decision to permit the use of digital modulation on MDS and ITFS channels, and were designed to assure that the 45 dB and 0 dB DIU ratios used to assure protection would continue io be protective of video reception. ***See Amendment of Parts 1, 21 and 74 to Enable Multipoint Distribution Service and Instructional Television Fired Service Licensees to Engage in Fixed Two-Way Transmissions,*** 14 FCC Rcd 12764, 12786 (1999). Since D/U ratios will **no** longer be utilized to provide interference protection outside the MBS, the concern that led to subsections (e) will no longer be applicable outside the MBS. Thus, the two subsections can safely be eliminated, allowing technologies that do not have a uniform spectral density to be deployed in the bands.

equipment designers to make the most efficient use of the 2.1 GHz and 2.5 GHz bands. It is important to recognize that no change is being proposed in the requirement that MDS and ITFS licensees and equipment manufacturers comport with the restrictions on power contained in Parts 1 and 2 that are designed to assure the protection of human health and safety. Indeed, the new rules should include a provision modeled on Section 27.52 making clear that licensees and manufacturers are subject to the radio frequency radiation exposure requirements specified in §§1.1307(b), 2.1091, and 2.1093 of the Rules and mandating that applications for equipment authorization of mobile or portable devices operating contain a statement confirming compliance with these requirements for both fundamental emissions and unwanted emissions.[71] Moreover, to make clear that applicability of Sections 2.1091 and 2.1093 to MDS and ITFS, the Commission should amend Sections 2.1091(c) and 2.1093(c) to add the two services to the list of services specifically delineated as being subject to the rules.

b) Signal Limits Bevond The GSA Border

As the Commission has recognized in several recent decisions, the use of a field strength limit beyond the licensee's service area boundary is generally preferable to the use of mandatory Section 101.103-style coordination when the service involved includes a mobile component.[72] As the Commission has recognized, formal pre-construction coordination requirements "impose unnecessary coordination costs for facilities with a low potential for interference and increase the potential for undesirable strategic or anti-competitive behavior."[73] The instant proposal is designed to put such problems behind the MDS/ITFS industry. Moreover, for formal coordination to be effective, both licensees must have clear plans for their spectrum – it will likely be true in many situations that one licensee will be moving forward with a given technology while the neighboring licensee is still evaluating possible services and/or equipment. As a result, it often will be difficult, if not impossible, for meaningful prior coordination to take place.

Based on analyses conducted by the WCA Technical Task Group, WCA, NIA and CTN recommend that the Commission establish for MDS and ITFS operations outside the MBS the same signal strength limit imposed on a variety of other flexible use services – signals cannot exceed 47 dBμV/m beyond a licensee's GSA.[74] This signal level appears to be the minimum that will limit potentially disruptive signals into an adjoining service area, while at the same time permitting a licensee to substantially serve its GSA, including areas near the border. To avoid any confusion, WCA, NIA and CTN suggest that the Commission make clear that this number is to be measured at 1.5 meters (approximately 5 feet) above ground level. WCA, NIA and CTN

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[71] **Applicants for equipment authorization should be required to submit the technical information showing the basis for this statement to the Commission upon request.**

[72] ***See* 27** *MHz R&O*, 17 **FCC** Rcd **at** 10030 **("Field strength limits have generally been adopted for land mobile services, while frequency coordination requirements have primarily been used in fixed services.").**

[73] ***Upper* 700** *MHz Band Service Rules NPRM*, **14 FCC** Rcd **at** 11035.

[74] ***See,*** *e.g.* **47 C.F.R.§** 27.55 (WCS); $24.236 (PCS)

appreciate that in the past the Commission has not designated a measurement height when applying the 47 dBμV/m standard, but they believe it is necessary here.

The designation of a measurement height will eliminate any potential for argument over what could be a significant difference – a licensee may be well within the 47 dBμV/m benchmark close to ground level (where subscriber units are likely to be), but exceed it far higher in the air, above the signal attenuating ground clutter. In selecting the 47 dBμV/m standard, WCA, NIA and CTN have focused on the signal strength necessary to provide service to customer units near the border. As a result, 1.5 meters is an appropriate measurement height, as it approximates the height at which handheld devices, desktop modem antennas, and other likely customer equipment antennas will be located. If the measurements are to be taken higher in the air (above the ground clutter), a different benchmark allowing greater signal strength would be needed.

As the Commission has recognized in similar contexts, "[e]ven with a boundary field strength limit, some degree of coordination and joint planning between bordering licensees appears likely to be needed to ensure efficient spectrum use on either side of the boundary."[75] That is certainly true here. While 47 dBμV/m appears to be the minimum signal level at the border that will still allow a licensee to serve its service area, signals that measure 47 dBμV/m at the border nonetheless have the potential for interfering with the neighboring cochannel licensee. If the service develops like broadband PCS – where the channels at 1850-1910 MHz are used for upstream and the channels at 1930-1990 MHz are used for downstream – the potential for problems will be limited. However, even then, it will not be immaterial. Because of the large size of broadband PCS geographic service areas, border problems tend to arise in the proverbial "middle of nowhere." By contrast, the borders of GSAs (most of which are going to be based on 35-mile radius circles that are truncated to eliminate overlaps pursuant to Appendix A) are frequently going to fall in relatively urbanized areas. Thus, border interference issues that are a mere nuisance in broadband PCS will present significant additional challenges for MDS/ITFS licensees.

And, of course, that assumes that, as with broadband PCS, all licensees deploy relatively compatible technology. That is an assumption that WCA, NIA and CTN cannot make at this time. For this reason, and consistent with Commission policies favoring flexible use of spectrum, the proposed rules are expressly designed to be "technology agnostic." It is still too early to tell with any degree of certainty whether the non-MBS channels are going to be used primarily for TDD, primarily for FDD, of for a mixture of the two. What that means **is** that, unlike with broadband PCS, a base station installed by one operator near a GSA border may be transmitting downstream on a given channel, while a base station installed on the other side of the border is using the same channel for transmission from customer equipment. This creates a

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[75] *Amendments lo Parts 1, 2, 27 and YO of the Commission's Rules to License Services in the 216-220 MHz, 1390-1395 MHz, 1427-1429 MHz, 1429-1432 MHz, 1432-1435 MHz, 1670-1675 MHz, and 2385-2390 MHz Government Transfer Bands,* **17 FCC Rcd 2500,2539** (2002)["*27 MHz NPRM*"], ***citing Amendment of Parts 2, 15, and 97 of the Commission's Rules to Permit Use of Radio Frequencies Above 40 GHz for New Radio Applications,* 13 FCC Rcd 16947,** 16994-97 **(1998).**

heightened risk of cochannel interference, but it is the price that must he paid to accommodate FDD and TDD technologies in the same band.

That is not to say that cochannel interference between FDD and TDD is inevitable, merely that it can occur if system operators do not cooperate with one another. Indeed, WCA's Technical Task Group believes that there are a wide variety of techniques that can be utilized to mitigate cochannel interference between even the least compatible technologies, including adding beam tilts, modifying antenna orientation, coordinating frequency reuse patterns and even limiting the usage of certain frequencies in border areas. However, there is considerable tension between the desire to minimize additional regulation above and beyond the 47 dBμV/m benchmark and the recognition that one licensee can do considerable damage to another's system if it does not cooperate. Due to the unique features of the MDS/ITFS band, and the need to accommodate multiple technologies in the band, WCA, **NIA** and CTN are exploring possible regulatory approaches that will focus on cooperative efforts by affected licensees, but at the same time provide some regulatory "teeth" that offer licensees a modicum of certainty that systems will not he devastated by interference. They will keep the Commission apprised of those efforts.

Of course, regardless of what specific signal strength limit the Commission imposes at the border of the GSA, the Commission should continue its long-standing MDS/ITFS policy,[76] which has subsequently been incorporated into Section 27.55 of the Rules for WCS licensees, and allow neighboring MDS and ITFS licensees to agree upon alternative signal strength limits to be applied at their borders.[77]

c) Spectral Mask

For reasons quite similar to those discussed above regarding the signal strength limit at the GSA border, the industry has not yet been able to arrive at a consensus position on the spectral masks to be applied to the non-MBS channels for purposes of interference protecting the LBS, UBS and I channels. For the past several months, the WCA Technical Task Group has struggled mightily with the thorny problems presented when one attempts to accommodate adjacent channel operations using incompatible technologies, without forcing all licensees to utilize such extensive filtering or such large guardbands that viable service offerings are impossible. As the Commission has recognized, when considering out-of-band emission limits, it must consider "the potential adverse effects that may result on the commercial usefulness of the spectrum."[78] What WCA, NIA and CTN **are** attempting to develop is an approach to out-of-hand emissions that is generally protective of relatively compatible operations, and applies special rules to those situations (which they hope will be relatively rare) in which incompatible technologies are deployed on nearby channels.

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[76] ***See,*** *e.g.* 47 C.F.R. §§ 21.909(d)(2)(iii); 21.913(a); 74.939(d)(2)(iii); 74.985(a)

[77] ***See*** **27** *MHz R&O*, 17 FCC Rcd ai 10030 ("For additional flexibility in these bands, we will also allow licenses in adjacent areas to negotiate a different field strength limit."). ***See*** *also* **47** C.F.R. § 24.236 (allowing PCS licensees to agree **upon** a higher field strength **limit** ai the border than provided for in the Rules).

[78] *Lower* 700 *MHz R&O*, 17 FCC Rcd at 1069.

With respect to the spectral mask for LBS and UBS base stations, WCA, NIA and CTN believe that MDS/ITFS equipment should be designed such that on any frequency outside a licensee's frequency block, the power of any emission is be attenuated below the transmitter power (P) by at least 43 + 10 log(P) dB, measured in watts, unless otherwise agreed by the affected licensee.[79] While this rule is generally protective when adjacent channel licensees utilize compatible technologies, additional attenuation may he required in special circumstances.

Specifically, any licensee should be required after receipt of a written request from an adjacent channel licensee of a GSA that overlaps the GSA of the recipient licensee, to take such steps as are necessary to manage its out-of-band emissions such that they are attenuated below the transmitter power by at least *67* + 10log(P) dB measured **3** MHz into the channel of the licensee making the request, based upon a minimum separation of base stations of 0.92 miles from the recipient licensee's base station and adjusted in the event of closer spacing. The written request must certify that the requesting licensee intends to initiate service on the affected adjacent channel group on a date certain (not more than 1 year after the date of the notice), and that the additional attenuation is required due to the respective technical characteristics of its planned facilities and those of the party receiving the request. The request must also provide currently available information with respect to its planned network design comparable in scope to the information required to be filed upon completion of construction of its facilities.[80] The requesting licensee should have an ongoing obligation to advise the recipient of any changes to the network design and any changes as to the date certain on which it will commence service. The recipient should be obligated to meet the more stringent requirement by the date certain specified in the initial request or any supplement thereto (but no earlier than 90 days after receipt of a request or supplement). The licensee making the request must after the date certain specified in its request or any supplement manage its system to provide the same more stringent level of attenuation for the benefit of the recipient licensee.

Turning to the spectral mask for LBS and UBS customer equipment, WCA, NIA and CTN recommend that that MDS/ITFS equipment initially should be designed such that on any frequency outside a licensee's frequency block, the power of any emission should be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, measured in watts, unless otherwise agreed by the affected licensee. As is the case with respect to the proposed base station mask, while this rule is generally protective when adjacent channel licensees utilize compatible technologies, additional attenuation may be required where non-coordinated systems are in close proximity. The problem, in a nutshell, is that even with the proposed mask, there is potential for interference between customer equipment operating in close proximity on non-coordinated, adjacent channel systems. WCA, NIA and CTN are exploring possible regulatory approaches that will focus on cooperative efforts by affected licensees to mitigate interference,

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[79] The Commission should retain the approach of Section 21.908(a) and provide for all of the various out-or-band emission requirements to be measured at the outermost edges of the combined channels where two or more channels licensed to one **or** more licensees are used as part of the same system. ***See also*** *Omnipoint* ***Request for Broadband Declaratory Ruling Or Waiver Concerning*** *PCS* ***Emission Limits*** *Rule* ***Section*** *24.238,* **15** FCC Rcd **13422** (2000)(allowing **PCS** licensees to meet spectral mask at outermost edges of co-owned adjacent channels).

[80] ***See supra*** at Section IV.A.1.

but at the same time provide some regulatory certainty that the potential for interference will be limited. They will keep the Commission apprised of those efforts.

With respect to the narrower I channels, WCA, NIA and CTN are proposing that on any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least 80+10 log(P) dB for the I channels, measured in watts, unless the licensee of the affected channel consents to accept higher out-of-band emissions. This spectral mask should apply to base stations and consumer units.[81]

d) Other Restrictions On Out-Of Band Emissions

Since one of the primary objectives of the new bandplan is to insulate operations in the MBS from possible interference caused by transmissions originating outside the MBS, WCA, NIA and CTN believe it is appropriate to adopt a restriction on out-of-band emissions into the MBS that is more restrictive than the spectral mask generally applied to operations in the LBS and UBS. Therefore, based on the recommendation of WCA's Technical Task Group, they propose that the Commission adopt the following requirement:

> In addition to the other requirements imposed on out-of-band emissions by stations operating outside the MBS, the licensee of any transmitter operating in the LBS, UBS, **I,** J, or **K** channels shall manage its out-of-band emissions such that the noise power introduced into an MBS channel does not exceed an EIRP of **–**37 dBm without the consent of the affected MBS channel licensee. Notwithstanding the foregoing, if the licensee of a channel outside the MBS digitizes a channel within the MBS, the noise power introduced into that channel of the MBS shall not exceed an EIRP of **–20** dBm without the consent of the affected MBS channel licensee. For purposes of this requirement, the power level shall be measured at the output of the transmitter, and may be measured using a measurement device with a 6 MHz integration bandwidth or using a device with a 1 MHz integration bandwidth, provided that if a 1 MHz integration bandwidth is utilized the measurement is made in the 1 MHz portion of the MBS channel that is closest to carrier frequency being transmitted by the transmitter (*i.e.* either 2572-2578 MHz or 2608-2614 MHz) and the power level is adjusted to 6 MHz by adding 7.8 dB to the 1 MHz measurement reading.

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[81] **Compliance with these provisions should be based on the use of measurement instrumentation employing a resolution bandwidth of 300 Hz or greater. However, in the 300 Hz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power. When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the licensee's frequency block edges, both upper and lower, as the design permits.**

e) Restrictions on I Channel Usage

While WCA, NIA and CTN are proposing that operations in the I band be generally subject to the same rules as those in the LBS and UBS bands, that proposal is qualified by one caveat — operations in the I band should be secondary with respect to operations in the LBS, MBS and UBS. In other words, although the I channels should continue to be primary as against other, an I channel licensee – even if in full compliance with the technical rules – should be required to take all steps necessary (including ceasing operations) to avoid harmful interference to any operations in the LBS, MBS or UBS. And, absent agreement otherwise, an I channel licensee must accept any interference caused by an LBS, MBS or UBS licensee operating in compliance with the rules.

f) Eliminate Restrictions On Omnidirectional Antennas

In connection with the adoption of rules applicable to the non-MBS band, the Commission should eliminate the requirement, currently found in Sections 21.906(d) and 74.937(a), that prevents customer equipment from utilizing non-directional antennas unless operating with an EIRP of -6 dBW or less. This requirement has not been a serious impediment to the introduction of first generation MDS/ITFS technology, which requires that consumer equipment include high-gain directional antennas in order to communicate with distant base stations. However, these requirements could preclude the introduction of a wide variety of portable, nomadic and mobile services which require non-directional antennas because the physical relationship between the customer and a system base station is constantly changing.[82]

In the *MDS/ITFS Two-Way* ***Reconsideration Order,*** the Commission retained the ban on most omnidirectional customer antennas citing a vague concern over the potential for harmful interference to other systems." Whatever rationale might have once justified this rule, it has no applicability to services that will be rendered outside the MBS. No Part 27 or other flexible use service is required by the Commission to utilize directional antennas in customer equipment, and there is no sound reason for MDS/ITFS to be treated differently. The Commission has recognized that "the use of low power transceivers which can be placed on a desk or other convenient indoor location to provide high-speed wireless internet access is, we believe, an appropriate and innovative use of the spectrum and should be accommodated if at all possible."[84] Eliminating the restrictions on omnidirectional antennas is one significant step the Commission can take now to accommodate such applications.

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[82] **For example, a person who is walking down the street and using a wireless-equipped PDA to get directions to his or her destination cannot be expected to constantly swivel a directional antenna so that it is always pointed at the base station. The situation is akin to that in mobile voice services – cellular and PCS services would be far less viable if the user were required to constantly keep a directional antenna pointed at the nearest base station.**

[83] *MDS/ITFS Two-Way* ***Reconsideration Order,*** **14** FCC Rcd **at** 12781. It **should** be **noted that this rationale was illogical. Because Appendix D requires an** interference **analysis to factor in the antenna pattern** of the **customer unit, the use** of **omnidirectional customer antennas would have been considered and no facilities authorized if interference was a threat.**

[84] ***Id.***

g) Modification Of Professional Installation Requirement

Now is also an appropriate time for the Commission to substantially modify its rules mandating the professional installation of customer equipment (currently contained within 21.909(n) and 74.939(p)), as those rules clearly will be rendered obsolete upon the transition to the new bandplan.

By way of background, the MDS and ITFS professional installation requirements came about due to two concerns expressed in MM Docket No. 97-217: (1) fears that non-professional installation could pose a threat of excessive RF exposure to humans that come in close contact with response stations; and (2) concerns that the installation and operation of response stations near an ITFS receive site could result in an overload of an older block downconverter. To address the second issue, in its initial *MDS/ITFS* ***Two-Way Report and Order,*** the Commission created a notification zone with a radius of 1960 feet around each ITFS registered receive site and required that advance notification be given to the ITFS licensee before any response station could be installed within a notification zone. Recognizing that consumers were unlikely to know of their proximity to registered ITFS receive sites, the Commission required professional installation of all response stations, no matter where located, to minimize the risk that a response station would be installed within a notification zone without the requisite notice being given. In addition, the Commission recognized that professional installation minimized the risk of excessive human exposure to RF emissions.[85]

Acting on petitions for reconsideration of those requirements, the Commission subsequently relaxed these restrictions for certain classes of customer equipment. The ***MDS/ITFS*** *Two-way* ***Reconsideration Order*** retained the requirements of Sections 21.909(n) and 74.939(p) of the Commission's rules mandating that "[a]ll response stations utilizing an EIRP greater than 18 dBW shall be installed by the associated hub licensee or by the licensee's employees or agents." Because the Commission continued to believe that the threat of RF exposure at these high power levels is substantial, professional installation is always required for response stations operating at an EIRP of more than +18 dBW regardless of whether an **ITFS** licensee waives its right to advance notice or professional installation.[86] WCA, NIA and CTN do not object to retention of that policy. What they do object to is continued application of a professional installation requirement on stations operating outside the MBS at or below +18 dBW EIRP.

Both the advance notification and professional installation requirements were eliminated by the *MDS/ITFS Two-* ***Way Reconsideration Order*** for response stations operating at no more than -6 dBW, as the Commission was convinced that neither RF overexposure nor block downconverter overload was a risk at such low emission levels.[87] With respect to medium power

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[85] ***See*** *MDS/ITFS* ***Two-way Report and Order,*** **13** FCC Rcd **at** 19127-29.

[86] ***See*** *MDS/ITFS* ***Two-way Reconsideration Order,*** **14 FCC** Rcd **at** 12777-79.

[87] **This** outcome **is clearly reflected in paragraph 32** of **the** *MDS/ITFS* ***Reconsideration Order,*** **which provides that "response stations with an** EIRP no **greater than -6** dBW do **not need to comply with the advance notification and professional installation requirements." Note that this sentence is at odds with the specific language** of **Sections**

response stations, the actual rules promulgated in the *MDS/ITFS Two-Way* ***Reconsideration Order*** do not accurately reflect the changes to the professional installation requirement that were intended by the Commission. As currently written, Sections 21.909(n) and 74.939(p) of the Commission's rules require merely that "[a]ll response stations utilizing an EIRP greater than +18 dBW shall be installed by the associated hub licensee or by the licensee's employees or agents" and do not impose any professional installation requirements on response stations operating at +18 dBW ElRP or less. In the view of WCA, NIA and CTN, that is an appropriate policy.

However, although not reflected in the actual rules, Paragraphs 36 and 27 of the ***MDS/ITFS Two-Way Reconsideration Order*** suggest that the Commission intended for medium power response stations (those operating at more than **-6** dBW but no more than +18 dBW) to be subject to professional installation requirements when advance notice is required." Whatever the Commission's actual intentions, it is clear that once the transition to the new bandplan occurs and licensees are operating upstream facilities outside the MBS, there is no longer any need for professional installation of customer equipment operating between *-6* dBW and +18 dBW. Whether customer equipment is located near an ITFS receive site will no longer be of any moment – the new downconverters provided to ITFS receive sites and the various proposed restrictions on emissions into the MBS will minimize block downconverter interference from customer equipment into ITFS receive sites without concern as to whether the professional installer will accurately aim the reception equipment. And, to the extent that the professional installation requirement was even based on concerns over RF emissions, WCA, **NIA** and CTN are proposing full applicability of the Commission's Part 1 and 2 RF health and safety rules, which should address any potential problem.

### *B. The Rules Applicable Within The MBS*

#### *1. The MBS Licensing Rules*

With regard to the MBS, WCA, **NIA** and CTN suggest that the Commission should retain (but streamline) the current approach of requiring applications, public notice and an opportunity to petition to deny before new facilities or substantial modifications to licensed facilities can be constructed in the MBS.[89] The ITFS community feels strongly that the protection this approach

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21.909(n) and 74.939(p), which only impose a professional installation obligation on response stations operating with an ElRP in excess of +18 dBW.

[88] Paragraph 36 of the *MDS/ITFS* Two-***Way Reconsideration Order*** provides that "response stations operating above -6 dBW EIRP and no greater than +18 dBW ElRP need not he installed professionally so long as each and every ITFS licensee whose notification zone encompasses such response stations consents in writing to non-professional installation of those response stations,." while Paragraph 21 provides that even in the absence of consent from all potentially-affected ITFS licensees, professional installation (as well as advance notification) is unnecessary where replacement downconverters meeting certain technical criteria are provided by the operator . ***See MDS/ITFS Two-Way Reconsideration Order,*** 14 FCC Rcd at 12782.

[89] After the New Bandplan Rules Effective Date, absent a waiver, and until such time as transitioned to the new handplan, a licensee operating under the current bandplan should be permitted to make modifications to stations that are operating in whole or in part **on** 2500-2566 MHz and 2620-2686 MHz (the LBS and UBS spectrum) without

affords high-power, high-site systems that are relatively static in design is worth the costs associated with complying with the licensing process. Yet, the licensing process certainly can be revised so that it is less burdensome on licensees and the Commission alike. More specifically, WCA, NIA and CTN would prefer a system under which:

- Each ITFS licensee would have the exclusive right to submit applications for new MBS facilities that will use the licensee's assigned spectrum within its GSA;

- Licensees contemplating modifications to licensed facilities will only be required to apply for prior Commission approval and be subject to formal application processing for "major modifications." For purposes of this requirement, a "major modification" should be defined as (i) any change in frequency; (ii) any change in polarization; (iii) any increase in height of more than 8 meters (26 feet); (iv) any station relocation of more than 1.6 kilometers (1 mile); (v) any change in the frequency offset of an analog station (however, an analog station upgrading from no frequency offset to any specific frequency offset (minus, zero, or plus) would not be deemed a major modification); any increase in occupied bandwidth; or (vi) any change to the transmission system that results in an increase in EIRF' of more than 1.5 dB in any direction;

- A licensee should be permitted to make non-major modifications to its system without prior Commission approval, so long as notice of the non-major modifications is given within 30 days of completion. However, any aggregation of minor changes in the prior three years that would have the effect of a major modification should be treated as a major change;

- Applications for new stations, and for major modifications, as well as notices of changes, should have to be filed electronically through ULS and applications should be cut-off from competing applications immediately upon filing;

- The electronic application form should be substantially streamlined from the current forms, limited to basic identifying data regarding the licensee, pertinent technical details regarding the proposed facilities" and a certification of compliance with the applicable interference-protection rules. The current

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transitioning to the new bandplan, so long as the modification docs not increase the modifying licensee's signal level within the GSA of any cochannel licensee that has converted to the new bandplan. This issue is discussed *further* in Appendix B, note 2.

[90] That data should include the coordinates of the station (in NAD 83) and for each transmission antenna comprising the facility: the site elevation AMSL; the height AGL of the top of the antenna supporting structure, including appurtenances; the height AGL of the center of radiation, the make and model of each transmission antenna and the horizontal and vertical pattern profiles (including any electrical beam tilt); the orientation of the transmission antenna; any mechanical beam till *of* the transmission antenna (direction and amount of tilt); and the EIRP in the direction of the main lobe of each antenna. It is also requested that the Commission require applicants to specify the transmitter output power and all line and combiner losses, but to clarify that in the event of any inconsistency between that **data** and the specified EIRP, the EIRP will control for all regulatory purposes.

requirement for serving the application and underlying interference analyses on neighboring licensees and applicants should be eliminated;"

- Public notice of the filing of a major modification application and pertinent details would be given by the Commission as soon as possible after filing, and interested parties would be afforded **30** days thereafter to petition to deny or otherwise formally object;

- Absent the filing of a petition to deny or other formal objection, the application would be granted automatically without further action by the Commission on the 35th day following publication of the public notice.[92]

### *2. The MBS Technical And Operational Rules*

As a result of the work of the WCA Technical Task Group, there is now a general consensus that the technical and operational rules applied to MBS licensees can be substantially liberalized compared to those applicable to current MDS and ITFS licensees. More specifically, there is widespread agreement on the following:[93]

a) Protection Of The GSA And Grandfathered Receive Sites

With respect to operations after the New Bandplan Rules Effective Date, MBS channels should be entitled to protection throughout their GSAs on a basis similar to that afforded MDS and ITFS licensees under the current protected service area concept. In addition, any ITFS receive location that was installed within an ITFS licensee's protected service area but is outside its **GSA** should be entitled to site-specific protection if: (i) the reception system was installed at that site on or before the New Bandplan Rules Effective Date; (ii) the reception system was installed by or at the direction of the ITFS licensee;[94] and (iii) that reception system is either: (a)

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[91] This would result in consistency between the requirements for MDS and ITFS station modifications (which require service and, **in** many cases, service by registered mail and subsequent certification of completed service to the Commission) and for new ITFS main stations, where service has never been required. Given that the lack of a service requirement for ITFS new station applications has never proven problematic, there is no reason to believe that the complete elimination of the service requirement will result in any harm. However, it will ease a material burden on applicants and the Commission staff that otherwise has had to process "ITFS Service Notices" tiled under current Section 21.902(i)(4) of the Rules to demonstrate that service has been accomplished using registered mail.

[92] This provides the Commission staff a week to determine whether a petition to deny or other formal objection has been filed and, if so, take appropriate steps to prevent the automatic grant of the application until the issues raised have been resolved.

[93] No change for the MBS is proposed in the Commission's current rules allowing superchannelization and subchannelization. For simplicity's sake, all of the following discussions are based on the use of a 6 MHz channel. As is currently the case, the final rules should provide for **an** adjustment of the benchmarks where a lesser or greater bandwidth **is** employed by using the factor *10log[(actual* bandwidth in MHz)/(6 MHz)].

[94] Under this approach, a reception site that has been installed by the operator of a wireless cable system at a particular location at the specific direction of an affiliated ITFS licensee would be entitled to protection. However, a reception site that has been installed by the operator of a wireless cable system at the location of one of its wireless

actually used to receive ITFS programming that comports with Section 74.931(a)(1) or (b) of the current Rules; or (b) is located at a cable television system headend and the cable system relays such ITFS programming. Within twenty-one days of request, an ITFS licensee should be required to provide a cochannel or adjacent channel MBS or Transition Band licensee with a listing that identifies the location (by street address and, if known, geographic coordinates) of such ITFS receive sites, indicating the antenna make and model of the reception antenna and the height above ground level of that antenna. If known, the response should also specify the adjacent channel DIU ratio that can be tolerated by any receiver(s) at the receive site. The response to should be considered a representation not only to the potential Proponent, but also to the Commission. In the absence of a timely response, the requesting licensee should make at least two attempts to contact both the licensee and the licensee's designated ULS contact representative by telephone during normal business hours to ensure receipt of the request. If the requesting licensee makes contact with the licensee or its representative, and the licensee requests additional time to respond, the licensee should be given an additional fifteen (15) calendar days to respond. In the absence of a response, the requesting licensee should be permitted to proceed with its proposal without having to provide protection to eligible receive sites.

**As** is the case under the current rules, protection to the GSA of incumbent MDS and ITFS licensees and to grandfathered receive sites should be based on three fundamental requirements: (1) maintaining certain cochannel and adjacent channel DIU ratios at all points within the GSA and at the grandfathered receive sites outside the GSA, ***(2)*** restricting signal levels at the border of the GSA; and **(3)** limiting out-of-band emissions. **In** the case of MDS BTA auction winners (and future ITFS BTA auction winners), the Commission should continue its policy of utilizing factors (2) and **(3)** as the vehicles for providing interference protection to the BTA auction winners, without requiring applications for neighboring facilities to demonstrate compliance with minimum D/U requirements. Each of these three tools for assuring interference protection is discussed below.

b) Modification Of The Current DIU Requirements

*Cochannel D/U Requirements* – As is currently the case, when the proposed facilities will operate using analog modulation, applicants should be required to certify that the proposed facilities are predicted to provide a cochannel DIU ratio of at least the lesser of 45 dB or the pre-application predicted DIU ratio with respect to the GSA and any protected receive sites of every cochannel station with a GSA within 50 miles of the proposed facilities. However, unlike the current rule, the WCA, NIA and CTN recommend that when the "victim" facilities will operate using digital modulation. applicants should only be required to certify that the proposed facilities are predicted to provide a cochannel D/U ratio of at least the lesser of 32 dB[95] or the pre-

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cable **subscribers (*i.e.* installed without any specific direction** of **the** ITFS **licensee) should not he entitled to protection even** if **the ITFS licensee's programming can he viewed by subscribers to** the **wireless** cable **system.**

[95] **32** dB **was chosen as the appropriate benchmark because digital** MDS/ITFS **operations traditionally utilize** 64 QAM **modulation, which requites a** 26 dB carrier/noise **ratio 64** QAM **and system designers generally provide an additional *6*** dB of **fade margin.**

application predicted DIU ratio with respect to the GSA and protected receive sites of every cochannel station with a GSA within 50 miles of the proposed facilities. Based on a variety of experiences of the past several years with digital operations on MDS and ITFS channels, the WCA Technical Task Group concluded that the current 45 dB requirement was far too restrictive when applied to protect digital facilities.

In addition, the cochannel DIU requirement should be liberalized where both the applicant and the station being studied utilize precise frequency offset equipment in analog systems, or where the applicant proposes to upgrade its station and the station being studied to utilize such equipment. In those cases, it is proposed that the minimum cochannel DIU ratio be reduced to 38 dB, provided that the transmitters have, or will be upgraded to have, the appropriate ''plus,'' "zero," or ''minus'' 10,010 Hertz precision frequency offset with a ±3 Hz (or better) stability.

*Adjacent Channel D/U Requirements* – **As** is currently the case, an applicant should be required to certify that the predicted adjacent channel DIU ratio is at least the lesser of 0 dB or the pre-application predicted DIU ratio with respect to the GSA and protected receive sites of every adjacent channel station with a GSA within 50 miles of the proposed facilities.[96] However, WCA, **NIA** and CTN propose, based on the work of the WCA Technical Task Group, that where a grandfathered ITFS receive site outside the GSA utilizes receivers that have an adjacent channel rejection ratio that can tolerate less than 0 dB or in the event the applicant commits to supply such receivers, the predicted adjacent channel DIU ratio at such receive site shall equal or exceed such negative adjacent channel ratio.[97]

*Exceptions to the D/U Requirements* – As is currently the case, licensees should be free to agree to different cochannel and adjacent interference protection mechanisms as between themselves and to consent to interference that would otherwise be prohibited.[98] In addition, to avoid protecting ITFS receive sites or GSA locations where desired signal levels are unduly low, an applicant should not be required to comply with the cochannel and adjacent channel D/U requirements with respect to any point within a GSA or any protected ITFS receive site outside a GSA that is not predicted to receive a desired signal carrier level of ≥ -80 dBm.[99] Moreover,

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[96] WCA, NIA and CTN are exploring the possibility of a lower adjacent channel DIU benchmark for digital operations and will report to the Commission if agreement is reached.

[97] For example, if the television receiver at a given receive site has an adjacent channel rejection ratio of -10 dB, the Proponent must only protect that site to a -10 dB adjacent channel **DIU** ratio. If the television receiver at a given receive site currently tolerates only a +5 dB adjacent channel rejection ratio **and** the Transition Plan calls for the replacement of that receiver with one with a -10 dB ratio, then the required adjacent channel D N benchmark for that receive site drops from 0 dB to -10 dB.

[98] See, *e.g.* 47 C.F.R. §§ 21.902(b)(5); 21.909(d)(2)(ii), (iii), (iv)(C); 21.909(i)(1)(ii); 21.913(a); 21.913(b); 74.939(d)(2)(ii), (iii), (iv)(C); 74.939(i)(1)(ii); 74.985(a); 74.985(b)(2), (4), (8)

[99] The received carrier level should be predicted based on the receive site location, the actual receiving antenna gain and the actual receiving antenna height.

only a predicted undesired signal level greater than **–106.2** dBm should be considered to be an undesired signal for purposes the DIU requirements.[100]

In addition, the Commission should adopt a ***"de minimus"*** exception to the cochannel and adjacent channel DIU protection that is afforded to the GSA. Over the past two decades, many cases have arisen in which the DIU requirements can be met throughout a protected service area at all but a few isolated points (often uninhabited mountain tops). However, because the DIU requirements are absolute, the applicant was forced to restrict its own service offering in order to provide 100% protection to the neighbor. To counter this preclusive effect, it is proposed that when studying interference into a GSA, an applicant should be deemed to have satisfied its interference-protection obligation even if the cochannel DIU requirement or the adjacent channel DIU requirement is not met (or some other exception does not apply) with respect to a cumulative geographic area of no more than 0.5% of the total geographic area of the GSA. Agreements incorporating approaches similar to this have been entered into by many licensees on a bilateral basis, and have been found to significantly mitigate the preclusive effect of the Commission's absolute requirements.

c) Border Protection

WCA, NIA and CTN propose that for the MBS, the Commission essentially retain its current approach to restricting the strength of signals transmitted by a licensee outside its authorized service area – limit accumulated signal levels to -73 dBW/m$^2$ power flux density. However, as noted above, because the new GSA for some licensees **will** be smaller than their current protected service area, the Commission should grandfather the current signal strength levels consistent with past precedent. Thus, it is proposed that applicants for new or modified MBS stations should be required to certify either: (a) that the proposed facilities have been engineered such that the calculated free space power **flux** density will not exceed -73 dBW/m$^2$ (or the appropriate value for bandwidth other than 6 MHz) beyond the boundary of the GSA; (b) that as of the New Bandplan Rules Effective Date the calculated free space power flux density of the current stations exceeded -73 dBW/m$^2$ (or the appropriate value for bandwidth other than 6 MHz) beyond the boundary of the GSA and that the proposed modification does not increase the calculated power flux density at any location beyond the boundary of the GSA, or (c) that it has obtained the written consent of the entity licensed for the adjoining area to which the requirements of (a) or (b) have not been met.

d) Interference Analyses

Analyses of potential interference should be conducted using a terrain sensitive and 4/3 earth radius propagation model. When analyzing potential interference to points within a GSA, the current approach of assuming that a reference antenna oriented to receive the maximum desired signal level has been installed 9.1 meters (30 feet) above ground level should be

[100] Both **the** -80 dBm and the **-106.2** dBm values are to be adjusted *pro rata* in the event the applicable bandwidth varies from **6** MHz utilizing **the** factor 10log[(actual bandwidth in MHz)/(6 MHz)] in the event the applicable bandwidth varies from **6** MHz.

retained."[101] However, the reference antenna currently specified in Section 21.902(f)(4) of the rules should be modified to require 6 dB more cross-polarization rejection (*i.e.*, -26 dB instead of -20 dB). The reference antenna was initially adopted in 1984 as representative of that which would be utilized in challenging reception areas.[102] Antenna technology has improved substantially since, and the proposed 6 dB increase in cross-polarization rejection is more representative of the antenna models that would be used in difficult situations.

e) Out-Of-Band Emissions

With respect to operations in the MBS, WCA, NIA and CTN are proposing no change to the current restrictions on out-of-band emissions contained within Sections 21.908 and 74.936, other than to eliminate the unnecessarily loose separate mask for stations operating below -9 dBW (which are not likely to operate under the MBS rules) and to clarify that by private agreement licensees can agree to accept greater levels of out-of-band emissions than are permitted under the Commission's Rules.

Because no tightening of the MBS spectral mask is being proposed, there is a possibility that in some scenarios out-of-band emissions from MBS operations will cause interference to licensees in the LBS and UBS. While WCA, NIA and CTN do not believe that the risk is sufficient to require all MBS transmitters to restrict out-of-band emissions beyond the current mask, the Commission should require licensees of MBS channels to install and maintain filters at request of an LBS or UBS licensee with an overlapping GSA if the costs of acquiring and installing the filter on the MBS transmitter are paid by that LBS or UBS licensee and the provider of the filter can supply technical information demonstrating that the installation of such filter will not unreasonably degrade the performance of the licensee's system. If installation of the proposed filter would not cause a delta group delay of more than 100 nanoseconds for analog operation or more than 20 nanoseconds for digital operation, the installation of the filter will not be deemed to unreasonably degrade the performance of the system.

f) Equipment Upgrades

The Commission's current rules provide applicants a variety of opportunities to upgrade the facilities of licensees in order to comport with the Commission's rules. Continuing the policy embodied in Section 74.903(a)(4) of the current Rules, an applicant or Proponent should be permitted to upgrade reception antennas at eligible ITFS receive sites if necessary to achieve the required D/U benchmarks (but only to the extent such upgrades can reasonably be accommodated at a particular site based on zoning, structural and environmental considerations) if necessary to achieve the required D/U benchmarks.[103] Expanding on that policy, an applicant

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[101] ***See*** 47 C.F.R. §§ 21.902(f)(3)-(4), 74.937(a).

[102] ***See*** *Docket 80-113 R&O*, 98 F.C.C.2d at 83-87

[103] Section 74.903(a)(4) currently provides for MDS and **ITFS** applicants to demonstrate compliance with the applicable D/U ratios by demonstrating that an upgraded antenna will satisfy the benchmark and by agreeing in the application to provide such an antenna. WCA, NIA and CTN propose retaining the concept, hut since there will not be applications tiled in connection with the licensing of the default channels provided each group, the proffer of the

or Proponent should be permitted to make other modifications at an MBS receive site designed to assure that operations in the LBS and/or UBS do not result in excess signal levels being received at ITFS receive sites, subject to appropriate zoning, structural and environmental restrictions. The Commission should also retain the policies of Sections 21.904(c) and 74.935(c) under which an applicant is permitted to propose an increase in the EIRP of neighboring stations under appropriate circumstances. In addition, an applicant or Proponent should be permitted to propose digitization of another licensee's operations, provided the standards set forth in Appendix C to this white paper are met.

g) Permit The Pre-Grant Construction Of Facilities

The Commission should eliminate the provisions of Sections 21.43 of the Commission's Rules barring MDS licensee from commencing construction (as opposed to operation) of facilities until the application therefore has been granted. Similarly, the Commission should eliminate is policy (albeit one not incorporated into Part 74), of banning ITFS licensees from constructing facilities prior to grant. Under Section 319(d) of the Communications Act of 1934, as amended, the Commission has authority to eliminate these requirements.[104] In a variety of other services, the Commission has exercised its authority under Section 319(d) and permits applicants to commence construction of proposed facilities at their own risk.[105] There is no sound policy reason to do otherwise here. Indeed, the public will be well-served by such a change, since permitting pre-grant construction (but not operation) will expedite the inauguration of new services to the public.

### *3. ITFS Auction Rules*

In its 1998 ***First Report and Order*** in ***Implementation of Section 309(j) of the Communications Act,*** the Commission concluded that based on the express terms of Section 309(j) of the Communications Act of 1934,[106] the Commission is compelled to use competitive bidding to resolve mutually exclusive ITFS applications, notwithstanding the noncommercial

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**upgrade should come in the Transition** Plan. **A licensee that refuses to accept an upgraded antenna that comports with the rules cannot thereafter complain** of **interference to that receive site if the Proponent can demonstrate that such antenna upgrade is structurally sound, environmentally safe,** and **consistent with local zoning laws and regulations.**

[104] 47 U.S.C. § 319(d) (2000), ***amended by*** **Telecommunications Act of** 1996, **Pub. L.** No. 104-104, § 403(m), 110 **Stat.** 56 (1996).

[105] ***See Establishment of Policies and Service Rules for the Mobile Satellite Service in the 2 GHz Band,*** 15 FCC Rcd 16127, 16179-80 (2000); ***Amendment of Part 5 of the Commission's Rules to Revise the Experimental Radio Service Regulations,*** 13 FCC Rcd 21391, 21401 (1998); *MCI* ***Telecommunications Corporation Request for Section 319(d)*** *Waiver* ***in the Direct Broadcast Satellite Service,*** 12 FCC Rcd 9875, 9876 (1997); ***Teledesic Corporation Application*** *for* ***Authority to Construct, Launch, and Operate a Low Earth Orbit Satellite in the Domestic and International Fixed Satellite Service,*** 12 FCC Rcd 3154, 3163 (1997); ***Amendment*** of ***the Commission's Rules*** to ***Establish Rules and Policies Pertaining to a Mobile Satellite Service in*** *the* ***1610-1626.5/2483.5-2500 MHz Frequency Bands,*** 9 FCC Rcd 5936,5998 (1994).

[106] 47 U.S.C. § 309(j)

educational nature of the service.[107] While concluding that the channels reserved for ITFS were not exempt from competitive bidding, the Commission announced that, given the instructional nature of the ITFS service and the long-standing reservation of the ITFS spectrum for noncommercial educational use, it would request Congress to clarify whether it intended the Commission's expanded auction authority to include ITFS.[108] In March 2000, the Mass Media Bureau acknowledged that the law had not changed and issued a ***Public Notice*** opening a "white knight" settlement period "in anticipation of soon scheduling an auction for the pending mutually exclusive ITFS applications."[109] Thereafter, in its August 2000 ***Section 257 Report to Congress,*** the Commission again urged Congress to eliminate the requirement for ITFS auctions.[110] However, Congress has yet to modify the Commission's auction authority, and the MDS/ITFS community recognizes Congress is unlikely to do so.

Therefore, in order to resolve the mutually-exclusive ITFS applications pending before the Commission (most for more than seven years), WCA, NIA and CTN urge the Commission to proceed with auctions between the current applicants."' Before doing so, however, the Commission should again open a "white knight" settlement period during which it will accept universal settlements of mutually exclusive ITFS applications now on file. As it has done in the past, the Commission should accept settlement regardless of whether they:

> comply with the requirements of Section 73.3525(a)(3) precluding payments to dismissing applicants for new facilities in excess of their legitimate and prudent expenses. In addition, parties need not provide the information required in Section 73.3525(a)(5). Parties may also enter into settlement agreements, which will result in the award of the authorization to a non-applicant third party, including the pertinent MDS BTA authorization holder. We emphasize, however, that any "white knight" must demonstrate that it meets all eligibility criteria for the service, as set forth in 47 C.F.R. §§ 74.932 for ITFS users or 74.990 for wireless cable users. Pursuant to Section 74.990(a), only the BTA holder is qualified to submit any new application for commercial use of available ITFS frequencies within its BTA. Parties are also reminded that they are permitted to

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[107] ***Implementation of Section 309(j) of the Communications Act – Competitive Bidding for Commercial Broadcast and Instructional Television Fixed Service Licenses; Reexamination of the Policy Statement on Comparative Broadcast Hearings; and Proposals to Reform the Commission's Comparative Hearing Process to Expedite the Resolution of Cases***, 13 FCC Rcd 15920, 15999-16001 (1998)["*Broadcast Auction R&O*"], ***on recon.***, 14 FCC Rcd 8724 (1999), ***on further recon.***, 14 FCC Rcd **12541 (1999)**

[108] *Broadcast* **Auction** *R&O*, 13 FCC Rcd **at** 15999-16002.

[109] **"ITFS Mutually Exclusive Applications – Settlement Period,"** ***Public Notice,*** 15 FCC Rcd **591** (2000)["White **Knight Public Notice"].**

[110] ***See Identifying and Eliminating Market Entry Barriers For Entrepreneurs and Other Small Businesses,*** 15 FCC Rcd 15376,15445 **(2000).**

[111] ***See Broadcast Auction R&O,*** 13 **FCC Rcd at 16002.** "[W]e **believe it would not** serve the **public interest to accept additional competing ITFS applications despite our authority** to **do so under Section** 309(j)(1), **and we will therefore limit the eligible bidders in any auction** of **the pending** ITFS **applications to** those **with applications already on file."** ***See id.***

amend pending applications in order to resolve mutually exclusive applications, so long as no additional interference results.[112]

In addition to utilizing competitive bidding to resolve the currently pending competing applications, it is time for the Commission to adopt rules that will allow the Commission, for the first time since 1995, to accept applications from those eligible under Section 74.932(a) for the current ITFS "white space" – areas not within the GSA of any incumbent licensees. In the past seven years, there has been substantial demand for vacant ITFS spectrum, but the Commission has failed to open any windows for the submission of applications for new stations."'

In light of the requirement that competitive bidding be used to resolve mutually exclusive applications, it is suggested that the Commission do what it did for MDS and utilize BTAs as the basis for auctioning geographic service areas. While WCA, NIA and CTN appreciate that BTAs have fallen out of favor with the Commission for geographic licensing, it makes no sense to use any geographic service area for ITFS other than that used for MDS.

As the Commission did when it auctioned MDS white space using geographic licenses, incumbent ITFS and MDS GSAs[114] should be grandfathered, and the BTA winner should secure the space within the BTA that is not within an incumbent's GSA.[115] However, rather than bundle all of the vacant ITFS spectrum in a BTA in a single auction, the Commission should separately auction each of the A, B, C, D and G Groups. By holding auctions on a group-by-group basis, the Commission will best serve the needs of incumbent ITFS licensees – the most likely participants. Particularly as portable, nomadic and mobile commercial and educational applications develop, wide-area coverage will be required, which means that many incumbent licensees are going to be interested in expanding use of their current channels beyond the borders of their current GSA. Conducting auctions on a group-by-group basis will allow incumbents to secure the rights to their current channels in a larger area, without having to purchase spectrum they are not interested in utilizing.

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[112] See White Knight Public Notice (citations omitted).

[113] While WCA, NIA and CTN have been able to agree upon virtually all issues presented in this joint proposal, they have been unable to reach consensus on the question of whether, and if so how, to structure an ITFS BTA auction in a manner that accommodates existing provisions in the Commission's rules and policies permitting MDS BTA authorization holders to apply for, construct and operate commercial stations on up to eight available channels within their BTA, and granting educators subsequent specified educational access to capacity on such facilities. See 47 C.F.R. §§ 74.990 – 74.992; *MDS BTA* Auction Order, 10 FCC Rcd at 9612. To the extent that WCA, NIA or CTN disagree on this or other issues that may arise, each intends to separately file comments or other responsive documentation with respect to such issues or areas of disagreement.

[114] It must he noted that because of channel swaps and/or the licensing of commercial ITFS stations, there are MDS stations operating on the A, B, C, D and G channels, ITFS auction winners will be required to protect incumbent MDS facilities located on those channels.

[115] ***See*** 47 C.F.R. §21.924(c)("The area within the boundaries of a BTA to which a BTA authorization holder may provide [MDS] excludes the protected service areas of any incumbent MDS stations and previously proposed and authorized ITFS facilities, including registered receive sites.").