

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)	
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)	
Second Periodic Review of the)	MB Docket No. 03-15
Commission’s Rules and Policies)	
Affecting the Conversion)	RM 9832
To Digital Television)	
)	
Public Interest Obligations of TV)	MM Docket No. 99-360
Broadcast Licensees)	
)	
Children’s Television Obligations of)	MM Docket No. 00-167
Digital Television Broadcasters)	
)	
Standardized and Enhanced Disclosure)	MM Docket No. 00-168
Requirements for Television Broadcast)	
Licensee Public Interest Obligations)	

REPLY COMMENTS OF AXCERA, LLC

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Introduction

Axcera, LLC is a major global supplier of wireless communications systems. From its founding as ITS Corporation in 1982, through operation as the Broadband Wireless Group of ADC Telecommunications from 1996 to 2001, and now as Axcera, the company has been a prominent provider and innovator of television transmitters and related systems. Axcera's product line includes both analog and DTV transmitters at power levels from 10 watts to hundreds of kilowatts, UHF and VHF, and also an innovative line of MMDS equipment at the 2.5 GHz frequency range. Axcera has been a leading company in developing and providing new technology and products for the DTV transition. The company was the first to provide an all-digital 8-VSB exciter that incorporated continuous adaptive equalization for both linear and non-linear distortions. This technology is now a typical requirement for most high power DTV transmitters. In addition, the company pioneered Bandwidth Enhancement Technology (BET), which is a novel way to transmit a fully compatible, reduced bandwidth 8-VSB signal, which is of substantial benefit to DTV stations operating at the edge of the band.

Axcera is currently heavily involved in the development and practical realization of distributed transmission technology for DTV. The company has commercially developed the transmission equipment to demonstrate and deploy a working system. This equipment was demonstrated at the ATSC annual meeting in Washington, DC in March, 2003, and again at the NAB annual convention in Las Vegas, NV in April 2003. Several papers were presented at the NAB's Broadcast Engineering Conference on this subject, including one by David Hershberger, Principal Engineer of Axcera. Finally, Axcera has manufactured and supplied the distributed transmission equipment to WPSX-DT, State College, PA, who will soon be launching its operation under an experimental license.

Summary

Axcera's reply comments on the FCC NPRM announced as part of the Second Periodic Review deal primarily with the subject of distributed transmission technologies, which were addressed in section J of the NPRM, and by comments to the NPRM from the Merrill Weiss Group, LLC, the Association of Public Television Stations, the Association for Maximum Service Television/National Association of Broadcasters, Belo Corporation, Cox Broadcasting, Harris Corporation, and others.

In summary, Axcera wholeheartedly supports the concept of distributed transmission systems, and urges the Commission to establish rules to permit their use. While the current ATSC Candidate Standard for distributed transmission is fully compliant with ATSC A/53B, therefore requiring no changes to permit the signals themselves, the Commission does need to provide rules that address the licensing of digital boosters, power levels, emission masks, interference levels, and other issues. It is Axcera's belief that distributed transmission will provide substantial benefits to broadcasters and the public for many reasons, with some especially important ones summarized below:

- It allows for filling gaps in coverage – as noted by the Merrill Weiss Group and others, there are many locations that will not be able to provide coverage to their entire service area with a traditional high-power, single transmit location approach, especially when a UHF DTV channel is used to attempt to replicate VHF analog service. The nature of signal propagation at these higher frequencies likely will lead to significant coverage gaps due to terrain or other obstructions. Moreover, it makes sense to allow broadcasters to optimize their coverage as long as significant interference is not effected.
- It is efficient from a spectrum and power conservation standpoint – since distributed transmission provides coverage using the same channel from multiple transmission sites, it can minimize the need for translators on different frequencies to achieve this coverage. In addition, coverage can be more customized to the market with lower power transmitters that provides signals where they are needed, as opposed to the wasteful, brute force approach of centralized high power transmissions that may not provide ubiquitous coverage anyway.
- It can overcome limitations to DTV transmission progress caused by the lack of availability of tall tower sites for centralized high

power transmission. In a number of markets, this has been a serious impediment to beginning DTV service.

- It can provide a measure of redundancy – by its very nature, distributed transmission does not rely on one transmission from one location. The tragic events of September 11, 2001 at the World Trade Center in New York provide an example of the importance of redundancy.
- It allows for a staged progression to full market DTV coverage – stations could migrate to full coverage by installing more distributed transmission sites over time, which could be an attractive option to a large, high power site all at once.

To reiterate, Axcera believes that distributed transmission is a viable technology that should be an option that a broadcaster has to fulfill its DTV coverage needs and requirements. In the following sections, reply comments are offered to address each of the major points raised in the NPRM regarding this subject.

¶ 101 – Primary status, Part 73

Axcera fully supports the position of the Merrill Weiss Group and others, that it is essential that the multiple transmitters making up a distributed transmitter system should be afforded primary status, and be authorized by simple licensing procedures under part 73 of the FCC rules. Given that the premise of distributed transmission is to serve the stations primary coverage area, albeit in an unconventional manner; it would make no sense to have parts of this coverage area given secondary status. A similar argument can be made for Part 73 status – if primary DTV coverage is defined by part 73 of the FCC rules, then it would make no sense to have a different set of rules to achieve primary coverage in a different manner.

As to the question of the impact on existing secondary LPTV and translator operation, it is Axcera's belief that any impact would be minimal, since distributed transmission by itself does not imply extension of the existing coverage contour, only that it is achieved in a different way. Indeed, it is likely that interference outside of this contour would be less with a distributed transmission network, since similar primary coverage could be achieved with lower antenna heights and lower power transmitters. Thus there should not be any significant negative impact to the important secondary services.

¶ 102 – Locations and service area

By using distributed transmission, it is technically possible to create DTV coverage contours that match and even exceed an existing NTSC Grade B contour without increasing interference contours beyond that of a traditional single transmitter system. Axcera believes that distributed transmitters should be permitted such that a station's service area extends to, and even beyond the Grade B contour of the station's coverage area, and as previously noted, be afforded Part 73 status and simple licensing procedures. So long as the station does not increase the interference contour from a real or theoretical single transmitter system that would otherwise be permitted under the current rules, the only visible effect would be to increase the number of covered households without causing increased interference. In fact, this feature is one of the primary motivations in designing and building distributed transmission networks. If DTV stations are overly restricted in the licensing and application of such networks then they may be denied the

motivation of increased DTV viewers to improve or extend DTV coverage in many markets.

Distributed transmission can improve the ease of reception even for those households currently covered under assumptions built into the existing rules. The current DTV allocations are based on the assumption that viewers at the edge of the covered area will employ an outdoor antenna at significant height. Distributed transmission offers the benefit of significantly reducing the complexity of reception at locations that currently require outdoor antennas without increasing established interference contours. Axcera believes that seizing this opportunity to improve real world DTV reception would serve to accelerate the consumer acceptance of DTV in general because reception probabilities can be significantly improved and/or complexity of receive antennas reduced.

¶ 103 – **Power, antenna height, and emission mask**

Axcera is in agreement with the comments of the Merrill Weiss Group on the subject of power and antenna height, in that the controlling parameter in providing limitations on distributed transmission systems should only be interference to neighboring stations. Limitations on power or antenna height would be restricting some of the potential causes of interference, but it would be more sensible to provide flexibility in these variables, and limit only the interference that results. In this way, maximum benefit can be realized from systems and optimal designs can be effected.

In the matter of emission masks, Axcera also agrees with the Merrill Weiss group and others that the current DTV emission mask should govern distributed transmitters as well. This is consistent with comments proposing Part 73 and primary status for these stations. Axcera also agrees that a more relaxed emission mask may be worthwhile for very low power distributed transmitters that serve a very limited area and are unlikely to cause any significant interference. More analysis should be done on this matter, but for now, Axcera supports using the currently defined emission mask for all DTV transmissions enjoying primary status.

¶ 104 – **Interference Protection**

The question of what standards should apply to distributed transmitter networks should be addressed with the same ones that apply to single transmitter systems; that is, the *de minimis* limits of 2 percent reduction in population coverage reduction, and 10 percent reduction from all interfering stations. As Axcera proposes the treatment of distributed transmitter networks in much the same manner as single transmitters covering the service area, with coverage being achieved in a different way, this concept is consistent with that assertion. In other words, the fact that a station chooses to deploy distributed transmitters to cover his service area instead of, or in addition to a single transmitter should not make interference protection for neighboring stations any better or worse than otherwise.

Regarding the related issue of whether the interference standards should apply to each distributed transmitter, or the aggregate service area, it should be the aggregate service area. A distributed transmitter is only a part of the total signal footprint of the transmitter system, and while no distributed transmitter should be authorized to exceed overall interference standards, this can be equally addressed by applying the standards to the entire service area network.

¶ 105 – **Technical standards**

In addressing the question of what technical standards would be appropriate for distributed transmitters, Axcera's recommendation is much along the same lines as its response to interference protection, in that the Commission should set rules for interference protection only; interference being the potentially negative outcome of a number of causes, but do not try to regulate the causes themselves. Such an approach will lead to maximum flexibility, and will leave things like signal quality and system performance in the proper hands of the marketplace to decide. As such, Axcera recommends that the Commission should impose technical standards for distributed transmitters that are no different than those for single transmitters.

¶ 106 – **Should the FCC permit deployment of distributed transmission systems?**

Axcera firmly believes that the Commission should permit deployment of distributed transmission systems for the numerous reasons addressed in these reply comments. If interference standards are the same as for current single transmitter systems, there seems to be no good reason to disallow distributed transmission, and numerous benefits to broadcasters and the public interest by affording this flexibility in covering the service area. Axcera urges the Commission to act swiftly to approve the use of distributed transmission systems.

Respectfully submitted,

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