SOCIETY OF BROADCAST ENGINEERS
FCC LIAISON COMMITTEE

CHAIRMAN

DANE E. ERICKSEN, P.E., CSRTE
Hammett & Edison, Inc.
San Francisco, CA
707/996-5200 (voice)
707/996-5280 (fax)
dericksen@h-e.com

Committee Members

KENNETH J. BROWN
Consultant
White Plains, NY

GERRY DALTON, CBRE
TXU Communications
Dallas, TX

HOWARD FINE
Pacific Television Center
Los Angeles, CA

CLAY FREINWALD, CPBE
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Seattle, WA

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Booth, Freret, Imlay & Tepper
Silver Spring, MD

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Valhalla, NY

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Chicago, IL

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Board of Trustees
Partnership For Public Warning Institute
McLean, VA

KARL VOSS
TV Station KPNX
Mesa, AZ

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April 28, 2003

Marlene H. Dortch
Office of the Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Dear Ms. Dortch:

SBE hereby files its reply comments to the ET Docket 00-258 Third Notice of Proposed Rulemaking concerning Advanced Wireless Services (AWS). Because these comments are also pertinent to ET Docket 95-18 (MSS), they are also being filed as *ex parte* comments to that rulemaking.

Sincerely,

/s/ Dane E. Ericksen

Dane E. Ericksen

Enclosure

cc: All SBE FCC Liaison Committee members
All SBE Officers and Directors

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Amendment of Part 2 of the Commission's	)	ET Docket No. 00-258
Rules to Allocate Spectrum Below 3 GHz	)	
for Mobile and Fixed Services to Support	)	
the Introduction of New Advanced Wireless	)	
Services, including Third Generation	)	
Wireless Systems	)	

To: The Commission

Reply Comments of the Society of Broadcast Engineers, Inc.

The Society of Broadcast Engineers, Incorporated (SBE), the national association of broadcast engineers and technical communications professionals, with more than 5,000 members world wide, hereby respectfully submits its reply comments in the above-captioned Third Notice of Proposed Rulemaking regarding Third Generation Wireless Systems.

I. 3G Operations at 2,020-2,025 MHz Would Be at Risk of Interference *From* TV BAS Operations, as Well As An Interference Risk *To* TV BAS Operations

1. After reading the comments submitted in response to this Third Notice of Proposed Rulemaking ("NPRM"), especially those of the Wireless Communications Association International, Inc. ("WCA"), SBE now appreciates that there would be a second problem for 3G operations at 2,020–2,025 MHz: namely, in addition to the interference threat from 3G handsets to 2 GHz TV Broadcast Auxiliary Service ("BAS") electronic news gathering receive only ("ENG RO") sites, the operation of ENG trucks in the very same metro areas where 3G operations are most likely to be popular means that there would also be a risk of interference from ENG trucks to 3G base stations attempting to receive signals in an immediately adjacent 2,020–2,025 MHz band.[1]

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[1] The WCA comments stated, at Page 23:
"However, there is no evidence in the Third NPRM (or anywhere in the record, for that matter) which suggests that the 2,020–2,025 MHz band can be utilized for AWS without debilitating interference from Broadcast Auxiliary Service ("BAS") operations in the immediately adjacent 2,025–2,110 MHz band. To the contrary, the Society of Broadcast Engineers has submitted unrefuted evidence to the effect that BAS will cause significant interference to any PCS-like service (which would include AWS) in the 2,020–2,025 MHz band. Given the pervasive nature of BAS operations in the very same

2. Further, also based on the WCA comments, it appears unlikely that 3G handsets at 2,020–2,025 MHz could be built to have a sufficiently stringent Adjacent Channel Leakage Ratio ("ACLR") necessary to ensure that a 3G handset that might be operating in the vicinity of an ENG RO site would not cause chronic interference to ENG operations. This is a credible threat because the very metropolitan areas likely to see the most commonplace use of 3G handsets are also the areas of the most intensive ENG use.

3. If a news event occurs near a 3G base station having to receive in a 2,020–2,025 MHz 3G band, and if multiple ENG trucks (or even a single ENG truck), with equivalent isotropic radiated powers ("EIRPs") of up to 65 dBm should commence operation, there would be both a brute force overload ("BFO") interference threat and also an ACLR interference threat to the 3G base station. For example, new Section 74.637(a)(2)(iii) of the FCC Rules, which became effective on April 16, 2003, specifies that the ACLR for a digital ENG transmitter is capped at -80 dB. This means that a digital ENG truck could "leak" energy at 2,020-2,025 MHz of at least -15 dBm EIRP, and possibly much higher. For example, a digital ENG truck operating on refarmed BAS Channel A1 (2,025–2,032 MHz), with a bandwidth of 12 MHz, would only be required to have an attenuation, or ACLR, of 50 dB at the center of a nominally 5-MHz wide[2] 3G channel centered at 2,022.5 MHz.[3] This creates the possibility of multiple co-channel interfering signals with EIRPs of as high as +15.0 dBm (*i.e.*, the maximum TV Pickup station EIRP of 65 dBm minus a 50 dB ACLR). Even if a digital ENG truck is operating "low power" with a transmitter power output ("TPO") of just 1 watt (30 dBm) into a 20 dBi gain transmitting antenna (a typical gain for an ENG truck transmitting antenna), the on-channel EIRP would be 50 dBm and the adjacent band spurious energy, seen as co-channel interference by a PCS base station trying to tune a 3G signal at 2,024.9 MHz, would have an EIRP of 0 dBm. This would

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urban areas where AWS is likely to find its greatest demand, use of the 2,020–2,025 MHz band for AWS would be doomed to failure due to interference."

In its May 6, 2002, comments to WT Docket 02-55, SBE had noted that Specialized Mobile Radio ("SMR") operations at 1,990–2,025 MHz, as proposed by Nextel, raised the very same interference issues as would terrestrial MSS operations, as now adopted by the February 20, 2003, R&O to IB Docket 01-185 (albeit in a now reduced 2,000–2,020 MHz MSS band).

[2] Perhaps an aggregate of four 1.23-MHz wide CDMA 2000 or 3G channels, for an overall bandwidth of 4.92 MHz.

[3] Section 74.637(a)(2)(i) gives the formula $A = 35 + 0.8(G-50) + 10\text{Log}_{10}B$, where A = the required ACLR in dB, G = percent removed from the center frequency, and B = authorized bandwidth in MHz. For a digital ENG transmitter operating with a bandwidth of 12 MHz, centered on 2,031.0 MHz, the spacing to the center of a 5 MHz wide PCS channel centered on 2,022.5 MHz would be 8.5 MHz; dividing 8.5 MHz by 2,031.0 MHz gives a "percent removed" of 0.4%. This then gives an ACLR of just 45.4 dB; that is, $\text{ACLR} = 35 + 0.8([0.4-50]/100) + 10\log_{10}(12)$. However, since this is less than 50 dB, the "but in no event less than 50 dB" provision of Section 74.637(a)(2)(i) is triggered.

likely cause significant interference to the 3G base station receiver even if the ENG truck was a block away from the 3G base station.

4. Accordingly, SBE concurs with the WCA proposal that 2,020-2,025 MHz be used for low power, unlicensed PCS ("UPCS"), rather than attempting to place 3G handsets adjacent to refarmed ENG operations. In effect, using 2,020-2025 MHz for UPCS would provide a *de facto* guard band between both Mobile Satellite Service ("MSS") operations at 2,000-2,020 MHz, and 3G PCS operations at 1,990–2,000 MHz. SBE submits that this would be good spectrum policy, benefiting BAS, 3G and MSS.

5. Since asynchronous UPCS services are being removed from 1,910–1,920 MHz[4], allocating 2,020–2,025 MHz for UPCS would help offset that displacement, and would advance the Commission's objective of increasing the spectrum available for unlicensed services. However, just as UTAM, Inc.[5], states in its comments that should UPCS be moved out of 1,910–1,920 MHz that it expects the party or parties obtaining use of 1,910–1,920 MHz to fairly and fully compensate UTAM for its "band clearing activities,"[6] in the very same manner SBE asks the Commission to ensure that if UPCS is awarded replacement spectrum at 2,020-2,025 MHz, then that UTAM be required to share, on a *pro rata* basis, the cost of fairly and fully reimbursing broadcasters for their reasonable and prudent expenses in refarming the 2 GHz TV BAS band from 1,990–2,110 MHz to 2,025–2,110 MHz.

6. UPCS operations are typically inside businesses and houses, and have much shorter distances than the Commercial Mobile Radio Service ("CMRS") over which they attempt to communicate. Therefore, UPCS operations are much more likely to be a compatible neighbor to 2 GHz TV BAS operations than "high power" (compared to UPCS) 3G handsets would be, with their necessary base station receive sites with rooftop and tower mounted antennas. While outdoor receiving antennas increase the likelihood of service to 3G handsets, they also increase the likelihood of interference from 2 GHz TV BAS operations. In contrast, UPCS operations at 2,020–2,025 MHz would typically have the benefit of structure shielding from potentially interfering 2 GHz TV BAS operations.

7. Wireless personal communications for emergency managers and law enforcement has emerged as technology that helps us all be safer and respond better when emergencies occur. As

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4 Also addressed by WT Docket 02-55.

5 UTAM is a non-profit cooperative industry association chartered to spread, over the manufacturer community, the costs of relocating microwave facilities in the 1,910–1,930 MHz bands.

6 UTAM comments, at Page 5.

SBE has commented in the past in a variety of proceedings, broadcast ENG has and continues to be an important emergency response tool during major emergencies to keep law enforcement, emergency managers and the public up to date. We all have to work together in the face of emergencies, especially those that stem from terrorism. At a time in our nation's history when we must work together to defend our way of life, SBE believes we must build spectrum sharing foundations that are based on the best possible data that leads to solid engineering. This will help build the trust that will lead to more efficient spectrum use and its wonderful byproduct, better cooperation at the very times when it is most needed.

II. Summary

8. Using 2,020–2,025 MHz for 3G operations, immediately adjacent to re-farmed 2 GHz BAS ENG operations at 2,025–2,110 MHz, would not be prudent. Both would involve mobile operations, so it would be impossible to know in advance the locations of the individual handset transmitters (for 3G) or the locations of individual ENG trucks (for BAS). Mutual interference would be likely. A much better approach would be to reserve 2,020–2,025 MHz for UPCS operations. This would be a far more compatible use of 2,020–2,025 MHz and would in effect create a 5 MHz "guard band" between higher powered MSS handsets at 2,000-2,020 MHz and 3G handsets at 1,990–2,000 MHz, where stringent yet practical ACLRs should be sufficient to ensure no interference to refarmed BAS operations at 2,025–2,110 MHz.

Respectfully submitted,

Society of Broadcast Engineers, Inc.

/s/ Troy Pennington, CSRE
SBE President

/s/ Dane E. Ericksen, P.E., CSRTE
Chairman, SBE FCC Liaison Committee

/s/ Christopher D. Imlay, Esq.
General Counsel

April 28, 2003

Booth, Freret, Imlay & Tepper
14356 Cape May Road
Silver Spring, Maryland 20904
301/384-5525