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Exceedance Duration – Conclusion

- The rules of man and the laws of nature dictate that, as a minimum, an ESD Exceedance Duration of approximately one (1) second is inevitable and such a delay would not likely cause unacceptable interference. This is certainly true at Ka-Band where QUALCOMM's interests lie.

- This Exceedance Duration Criterion is *technology neutral* and should support the introduction of new technologies.

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Additional Slides

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Example of Channel Data Rate Sharing

		Code:	Watts/CPE:
Desired CPE Walsh Code Rate/Power:	WALSH		
CODE VALUE (RATE):		1024	0.0021
		Other Terminals Sharing Channel:	**Other CPE Power:**
Parallel (Other) Walsh Code Users:			
w4		0	0.5280
w8		1	0.2640
w16		2	0.1320
w32		4	0.0660
w64		8	0.0330
w128		16	0.0165
w256		32	0.0083
w512		64	0.0041
w1024		127	0.0021
Total Co-Channel Uplink CPE (Users;Power):		255	2.1120
Total Co-Channel Uplink Other CPE (Users; Power):		254	2.1099
Total EIRP Spectral Density Margin wrt FCC Limit:		0.01	dB

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Example Proposed Rule Change:

- **Part 25.138 (a)(1):**

The total number of simultaneously transmitting co-frequency GSO FSS earth stations operating in one uplink beam may generate an off-axis EIRP spectral density for co-polarized signals (when directing their power within ±3° of the GSO arc and under clear sky conditions) in accordance with Figure 25-XXX.

The maximum duration for which the total co-channel adjacent satellite EIRP spectral density may exceed A shall not exceed 1.0 second.

θ: is the average value of the angle, in degrees, measured from the axis of the main lobe of the earth station antennas to the direction of the potential victim space station.

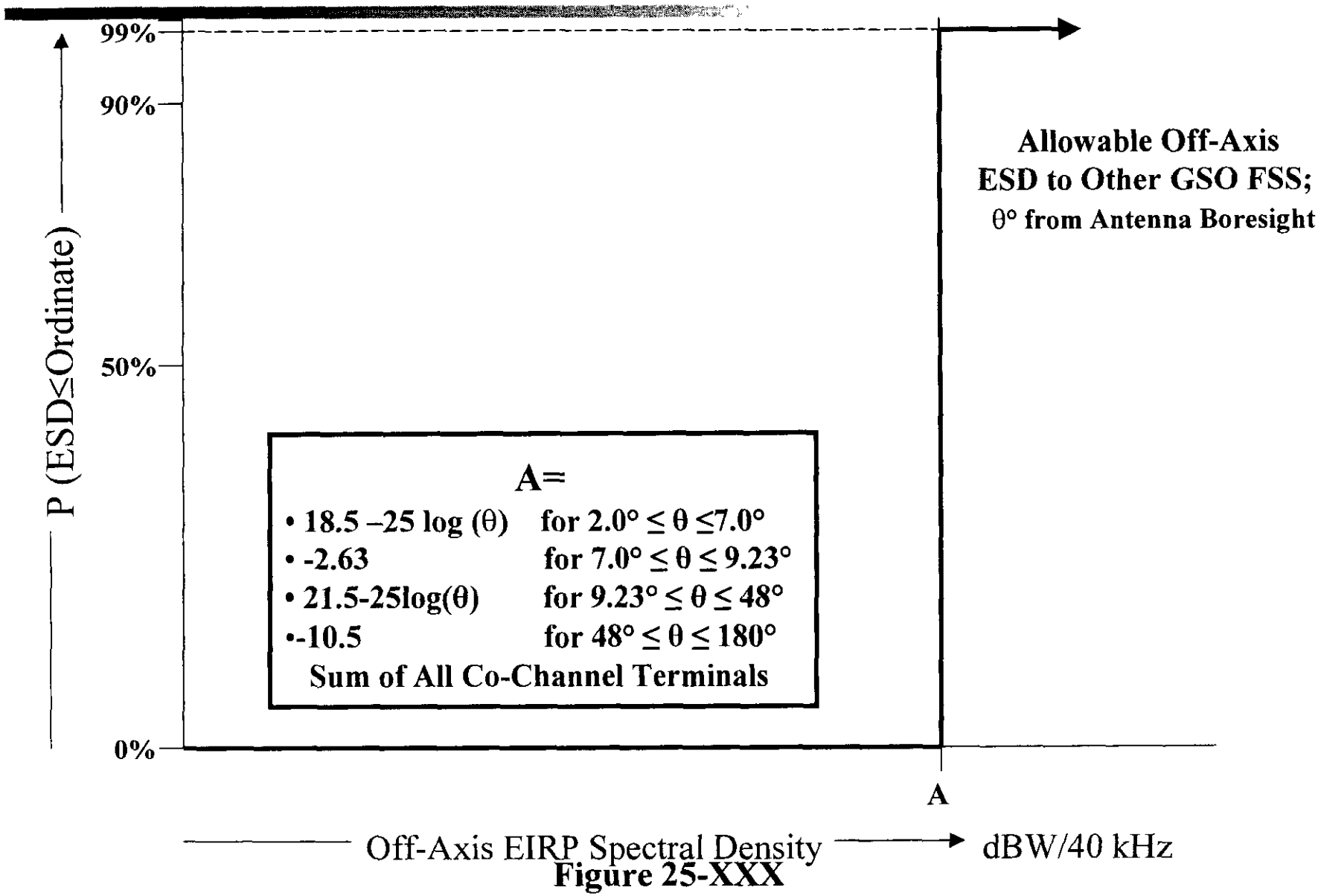

Figure 25-XXX

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Satellite Industry Association
Reply Comments
Re Part 25
Random Access Protocols

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"The QUALCOMM proposal is applicable only to contention protocol CDMA Systems. The proposal would not be applicable to reservation type systems such as TDMA, FDMA and non-random access CDMA. For example, TDMA uses narrow bandwidth on multiple shared carriers whereas contention protocol CDMA systems operate over the entire bandwidth."

- QUALCOMM has the following response to these comments:
  - The rules proposed by QUALCOMM are applicable to all multiple access methods.
  - Some TDMA systems are broadband (and use the full assigned bandwidth).
  - Many CDMA systems do not operate over the entire bandwidth available. Rather, many frequency channels are used.
  - Several QUALCOMM systems use BOTH contention and non-contention CDMA within the same system and the statistical methods proposed are applicable to both.
  - The Majority of Users in a Ka-Band System using QUALCOMM technology, would, in fact, be Employing Non-Contention CDMA.

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"The QUALCOMM proposal would place TDMA, FDMA and non-random access systems at a disadvantage to contention protocol CDMA systems."

- **QUALCOMM will be proposing a hybrid random access AND non-random access system for broadband Ka-Band service and thus, there is no disadvantage.**
- **TDMA systems might be considered to be disadvantaged (in the power dimension) *in any case* compared with CDMA because TDMA must transmit at a power level which supports the peak data rate of the system.**
- **FDMA systems are obsolete in comparison to other multiplexing systems but, would not be materially disadvantaged by the proposed new rule.**
- **Interference rules should not be designed to protect existing systems from competition from new technologies. Rather, they should be designed to protect the interference victim. -Nothing more.**

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"The SIA also opposes QUALCOMM's proposal to extend any regulations adopted regarding contention protocols to the Ka-Band."

"... it is premature to layer any additional regulations on these nascent networks without any basis for the new regulations."

- Current regulations, even those applicable to the Ka-Band, do not foster efficient utilization of satellite spectral and orbital location slot resources.
- Advanced technologies, particularly those that operate in a dynamic, packet switched, environment *must* adapt to statistically defined interference conditions if optimum benefit is to be achieved. Waiting to adopt these rules will not change the validity of this statement (now or in the future).
- A regulatory environment that makes efficient operation impossible and/or uncertain will prevent new operators from entering the business (which is not in the public interest).

- This issue is much broader than that which arises from the "contention protocol" Aloha issue. QCOM's proposals address this broader issue.
- QUALCOMM's proposed rules could bring into compliance with Part 25, operators whose Ku-Band terminals are currently not in compliance 100 percent of the time with the Adjacent Satellite Interference requirements of Part 25.