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February 22, 2000

Hon. William E. Kennard
Chairman, Federal Communications Commission
445 12th Street, S.W.
Washington, DC 20554

Re: *Ex Parte* Presentation of The Boeing Company
ET Docket No. 98-206
RM-9147
RM-9245

Dear Chairman Kennard:

As you may be aware, Boeing is an applicant to operate a non-geostationary orbit fixed-satellite service ("NGSO FSS") system in the Ku-band.[1] During the previous week, Boeing representatives held a series of meetings with engineering and legal staff in the Commission's International Bureau and Office of Engineering and Technology. The meetings were held to go over the details of a comprehensive interference analysis that Boeing filed with the Commission on February 16, 2000.[2]

Boeing's interference analysis addresses a proposal by Northpoint Technology, Ltd. ("Northpoint") to operate a one-way, point-to-multipoint television distribution system in portions of the Ku-band.[3] The analysis demonstrates:

- That Northpoint's proposed service will create large "exclusion zones" within which satellite earth station receivers operating with Boeing's NGSO FSS network will suffer unacceptable levels of interference, and

- Despite Northpoint's repeated claims to the contrary, Boeing will be unable to mitigate the interference adequately to provide service to consumers within the exclusion zones.

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[1] *See* Application for Authority to Launch and Operate a Non-Geostationary Medium Earth Orbit Satellite System in the Fixed Satellite Service, File No. SAT-LOA-19990108-00006 (Jan. 8, 1999).

[2] *See* Letter to Hon. William E. Kennard, Chairman, Federal Communications Commission, from David A. Nall, Counsel for The Boeing Company, Attachment 1 (Feb. 16, 2000) ("*Boeing Interference Analysis*").

[3] *See* Northpoint Petition for Rulemaking, RM-9245 (Mar. 6, 1998).

Northpoint Exclusion Zones

Several other important points were highlighted during last week's meetings between Boeing and the Commission's staff. First, it was noted that Northpoint's proposed service will cause unacceptable interference into Boeing receivers almost irrespective of the method used to define unacceptable interference.

For example, in Boeing's February 16th interference analysis, Boeing used the internationally accepted criteria found in ITU-R Recommendation S.1323.[4] Using that criteria, Boeing showed that an exclusion zone of at least three kilometers would be produced around each Northpoint transmitter whenever Northpoint operates at a relatively low transmit power.[5] Whenever Northpoint operates at its highest proposed transmit power, the exclusion zone increases to 129 kilometers.[6]

In contrast, Northpoint used an exceedingly lenient definition of unacceptable interference when it disclosed the level of interference that its system would produce into Boeing's network. Interestingly, Northpoint's definition was so lenient that Northpoint chose not to apply this same definition when describing the interference protection requirements of its own system – instead arguing for an interference protection level that is ten times more strenuous.[7] Despite this obvious double standard, however, Northpoint still concluded that its system would produce exclusion zones of about 200 meters for Boeing's network around each Northpoint transmitter when Northpoint operates at a low transmit power.[8]

A graphic illustration of the interference produced by the Northpoint system is provided in the following chart, which demonstrates the size of the exclusion zone produced by Northpoint assuming a progressively relaxed definition of unacceptable interference.

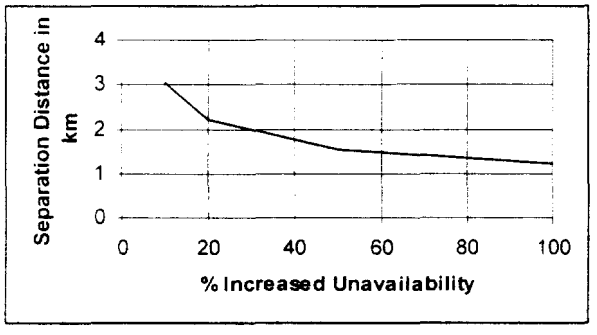

Chart 1 – Size of Northpoint Exclusion Zones Produced by Varying Interference Levels

[4] *See Boeing Interference Analysis*, Attachment 1 at 2.

[5] *See id.*, Attachment 1 at 8.

[6] *See id.*, Attachment 1 at 9.

[7] *See Comments of Northpoint Technology, Ltd.*, ET Docket No. 98-206, Technical Annex at 32 (Mar. 2, 1999).

[8] *See id.*, Technical Annex at 20.

The chart indicates that if Northpoint transmitters operate at power levels that increase the disruptive interference, or "system unavailability" of Boeing's network by 100% over the level produced by rain in much of the United States, then the size of the exclusion zone would still exceed one kilometer. In providing this illustration, Boeing wishes to note that a definition of unacceptable interference that permits Northpoint to increase Boeing's system unavailability by 100% would be entirely unacceptable and should be rejected outright by the Commission.

The practical effect of accepting the definitions and standards proposed by Northpoint in its application and filings would be to exclude Boeing from consumer service areas that are critical to the economic viability of its system. Any decision reducing or eliminating Boeing's system capabilities in such a way would jeopardize the future of the system.

Interference Mitigation

A second focus of the recent meetings between Boeing and the Commission staff was on interference mitigation techniques that Northpoint has suggested might be available to NGSO FSS operators to overcome interference from Northpoint. Using Boeing's February 16th interference analysis, the following points were raised and noted:

- **Satellite Diversity** – Boeing cannot use satellite diversity to mitigate interference from Northpoint transmitters because Northpoint's interference will come into the far sidelobe of Boeing receivers, disrupting Boeing's satellite signals regardless of which Boeing satellite provides the transmission.

- **Natural Shielding** – Boeing cannot use natural shielding because its consumer receivers must be able to see in all directions down to a 30° elevation angle in order to communicate with its NGSO satellites. Furthermore, in order to avoid the geostationary arc, Boeing receivers will often communicate with NGSO satellites located to the north, directly toward the source of Northpoint interference.

- **Artificial Shielding** – Boeing cannot use artificial shielding because any shield within about one kilometer of a Northpoint transmitter would need to be unreasonably tall (about 2 to 10 meters). Additionally, any shield within about 350 meters of a Northpoint transmitter tall enough to block Northpoint's interference will also block signals from Boeing satellites at lower elevation angles.

- **Frequency Diversity** – Boeing cannot use frequency diversity because the vast majority of the communications carried by Boeing's network will be "point-to-multipoint" and must be provided in spectrum accessible to all of Boeing's customers. As a result, frequency diversity would effectively cut in half the forward throughput capacity (the most bandwidth intensive part of a network) of Boeing's satellite system, compromising its potential viability as a prudent business investment.

- **Band Segmentation** – Band segmentation is also not an acceptable option to resolve the interference problems raised by the Northpoint system. Band segmentation would almost certainly leave Boeing with insufficient forward throughput capacity to launch a viable broadband satellite communications network. Boeing is already negotiating at the Commission's behest with other NGSO applicants regarding the operation of multiple NGSO networks in the same portion of the Ku-band. Northpoint's request aggravates the spectrum shortage and the ability of Boeing's system to operate in a viable manner.

For the past three years, Boeing has worked diligently with domestic and international radio spectrum users to develop spectrum sharing techniques that enable Boeing's NGSO FSS system to operate on a co-equal basis in the Ku-band. Boeing's network protects geostationary FSS and direct broadcast satellite ("DBS") systems. Boeing's network also protects fixed microwave networks and the radiolocation service. In fact, Boeing's system is so well designed that Northpoint claims that Boeing's network would not cause interference into Northpoint's proposed system.[9]

In contrast to Boeing's exhaustive spectrum sharing efforts, Northpoint has proposed a system design that does not accommodate other spectrum users. Northpoint has been unapologetic in promoting a technology that will cause unacceptable interference into Boeing receivers, preventing Boeing from serving consumers wherever Northpoint operates.

The public interest would be seriously harmed if the Commission authorizes Northpoint to construct a terrestrial communications system in the Ku-band that is incompatible with NGSO FSS networks. Significant opportunities for new universally available consumer services could be jeopardized.

The lost opportunity would also have an immediate impact on Boeing. As you may be aware, Boeing is the largest aerospace company in the world, employing nearly 200,000 people, the vast majority of them in the United States. Following Boeing's pending acquisition of the Hughes space and communications businesses, Boeing will also be the largest satellite manufacturer in the world, with total annual revenues approaching $10 billion.

In order to maintain its position of leadership in aerospace and satellite communications, Boeing is seeking to expand greatly its contributions to the industry by launching and operating its own satellite communications network. Boeing will use its networks to provide competition for existing telecommunications service providers and to introduce a wide range of new services that either have not, or can not be provided to consumers using existing satellite-based and terrestrial networks.

Boeing's enhanced role in satellite communications will be realized, however, only if the Commission makes the hard decisions that are necessary to permit NGSO FSS networks to

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[9] *See id.*, Technical Annex at 29.

operate successfully in the Ku-band. One of these hard decisions involves a recognition that Northpoint's proposed service could be better accommodated in alternate frequencies, such as a portion of the more than three gigahertz of spectrum that have been previously allocated by the Commission for point-to-multipoint and wireless services. If the Commission fails to reach such a conclusion, the new and innovative broadband telecommunication services that Boeing seeks to provide to consumers may never become available.

Respectfully submitted,

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