

Engineering Statement
REQUEST FOR EXPERIMENTAL LICENSE
prepared for
Sprint Nextel Corporation
Experimental DT Reston, Virginia
Ch. 61 69 W

Sprint Nextel Corporation (“SNC”), seeks an Experimental License to transmit a digital low-power television signal on UHF Channel 61. The facility requested herein will be used to evaluate the technical performance of Digital Video Broadcast Handheld (“DVB-H”), a mobile video technology intended to broadcast video, audio, and data to handheld devices which would be used by the public.

Facilities Requested

The technical parameters for the proposed operation involve a non-directional transmitting antenna installed on the roof of an office building in Reston, Virginia. FAA notification is not required for this antenna, as it will not increase the height of the building by more than 6 meters. The building’s present overall height above ground is 18.5 meters, which would be increased to 24 meters considering the proposed antenna.

An effective radiated power (“ERP”) of 69 Watts with an antenna radiation center height above ground (“HAG”) of 21 meters is proposed. Six MHz bandwidth, DVB-T COFDM modulation will be utilized¹. The proposed station will be constructed to confine out-of-channel emissions within the “stringent” mask specified in §74.794 of the FCC’s Rules. A summary of the technical parameters for the proposed operation is provided in the attached **Table 1**.

NTSC, DTV, LPTV, and Class A Station Allocation Considerations

In the endeavor to select a channel that is unlikely to cause interference, a study of all nearby authorized stations in the FCC’s CDBS database was performed. An interference study per OET Bulletin 69² was performed to examine the change in

¹ The DVB-T modulation will be utilized to carry a digital video broadcast handhelds (“DVB-H”) encapsulated payload. See Digital Video Broadcasting (DVB); Transmission System for Handheld Terminals (DVB-H), European Telecommunications Standards Institute EN 302-304 V1.1.1; November, 2004.

² Although OET Bulletin 69 specifies procedures for quantifying interference caused by 8-VSB facilities,

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interference experienced by other stations that would result from the proposed Channel 61 facility. The results of the interference study, summarized in **Table 2**, indicate that the instant proposal will cause no additional interference to any authorized facility. The applicant recognizes the secondary status provided under Experimental Authorization and will cease operation as necessary in the event actual interference occurs.

Other Considerations

Based on data extracted from the FCC's CDBS database, there are no authorized AM, FM, or TV stations within 3.2 kilometers of the proposed facility. The nearest FCC monitoring station is at Laurel, Maryland, at a distance of 52 km from the proposed site. The proposed site exceeds by a great margin the minimum distance specified in §73.1030(c)(3)(ii) that would suggest consideration of the monitoring station.

The U.S. - Canadian agreement calls for notification of digital low-power stations within 100 km of the border. Similarly, the U.S. - Mexico agreement calls for notification of 1 kW (or less) low-power TV stations within 60 km of the border. As the proposed site is located at least 445 km from the nearest point on the U.S. - Canadian border and at least 2,352 km from the nearest point on the U.S. - Mexico border, the proposed facility does not require international coordination.

Conclusion

It is thus believed, based on the foregoing, that the facility proposed herein will satisfy all of the pertinent Commission Rules and Policies now in effect regarding allocation matters.

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laboratory tests have shown little difference between the desired-to-undesired ratios of DVB-T COFDM (to both NTSC and 8-VSB) and 8-VSB. See the VSB/COFDM Project (NAB and MSTV) "Investigation of VSB Improvements" December 2000. Adjustments in the OET Bulletin 69 computer program were made to consider use of the "stringent" emission mask.

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Environmental Considerations

The proposed transmitting antenna will be installed atop an existing building rooftop. Therefore, it is believed that this application may be categorically excluded from environmental processing pursuant to §1.1306 of the FCC Rules.

The proposed experimental operation was evaluated for human exposure to radiofrequency (RF) energy using the procedures outlined in the Commission's OET Bulletin No. 65 ("OET 65").

OET-65's formula for television transmitting antennas is based on the NTSC transmission standards, where the average power is normally much less than the peak power. For the DTV facility in the instant proposal, the peak-to-average ratio is different than the NTSC ratio. The DTV ERP figure herein refers to the average power level. The formula used for calculating DTV signal density in this analysis is essentially the same as equation (10) in OET-65.

$$S = (33.4098) (F^2) (ERP) / D^2$$

Where:

S	=	power density in microwatts/cm ²
ERP	=	total (average) ERP in Watts
F	=	relative field factor
D	=	distance in meters

Using this formula, calculations were made to predict power density attributable to the proposed facility at points two meters above ground level locations.

An ERP of 69 Watts, horizontally polarized, will be employed. The proposed channel 61 transmitting antenna, a Scala model SL-8, will have its center 21 meters above ground. This antenna has a relative field of less than 40% percent from 10 to 90 degrees below the horizontal plane (*i.e.*, below the antenna) according to data provided by the manufacturer. Thus, a value of 40 percent relative field is used for this

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calculation. The “uncontrolled / general population” limit specified in §1.1310 for Channel 61 is $503 \mu\text{W}/\text{cm}^2$.

Using the above equation, calculations were made to predict power density at two meters above ground level. Using this formula, the proposed facility will reach $1 \mu\text{W}/\text{cm}^2$, or 0.2 percent of the “uncontrolled / general public” Maximum Permissible Exposure (“MPE”) limit at two meters above ground level. At locations away from the building, the calculated RF power density is even lower, due to the increasing distance from the transmitting antenna. RF levels within the building are low due to attenuation of rooftop construction materials.

§1.1307(b)(3) states that facilities at locations with multiple transmitters are categorically excluded from responsibility for taking any corrective action in the areas where its contribution is less than five percent. Since the instant situation meets the five percent exclusion test at ground level, the impact of any other facilities near this site may be considered independently from this proposal. Accordingly, it is believed that the impact of the proposed operation should not be considered to be a factor at or near ground level as defined under §1.1307(b).

As demonstrated herein, excessive levels of RF energy will not be caused at publicly accessible areas at ground level near the antenna supporting structure. Consequently, members of the general public will not be exposed to RF levels in excess of the Commission’s guidelines.

With respect to worker safety, it is believed that based on the preceding analysis, excessive exposure would not occur in areas at ground level. According to information provided by representatives of *SNC*, locked doors restrict access to the entire rooftop. Building personnel carefully control access to the rooftop. A site exposure policy will be employed protecting maintenance workers from excessive exposure when work must be performed in areas where high RF levels may be present. Such protective measures

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include, but will not be limited to, power reduction or the shutdown of facilities when work must be performed in areas where the exposure guidelines would otherwise be exceeded.

Based on the preceding, it is believed that the instant proposal may be categorically excluded from environmental processing under Section 1.1306 of the Rules, hence preparation of an Environmental Assessment is not required.

Certification

The undersigned hereby certifies that the foregoing statement was prepared by him or under his direction, and that it is true and correct to the best of his knowledge and belief. Mr. Ryson is a senior engineer in the firm of Cavell, Mertz & Davis, Inc. and has submitted numerous engineering exhibits to the Federal Communications Commission. His qualifications are a matter of record with that agency.



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November 9, 2005

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List of Attachments
Table 1 – Technical Parameters
Table 2 – Interference Analysis Results Summary

Table 1
TECHNICAL PARAMETERS
prepared for
Sprint Nextel Corporation, Inc.
Experimental DT Reston, VA
Ch. 61 69W

Location

Site Address:	2003 Edmund Halley Drive	
Site City, State, Zip:	Reston, Fairfax County, Virginia 20191	
North Latitude:	38° 57' 04"	(NAD 27)
West Longitude:	77° 21' 34"	
North Latitude:	38° 57' 04"	(NAD 83)
West Longitude:	77° 21' 33"	
Antenna Structure Registration Number:	N/A	

Heights

Antenna Location Site Elevation:	129 meters AMSL
Overall Height:	24 meters AGL
Radiation Center Height:	21 meters AGL
Building Height:	18.5 meters AGL
Antenna Tip Height Above Building:	5.5 meters

Facilities

Location Type:	Fixed Base
Frequency:	752-758 MHz
UHF TV Channel:	61 (Digital)
Frequency Offset:	None
Effective Radiated Power:	69 Watts
Antenna Input Power:	5 Watts
Transmitter Output Power:	As Required to Reach 69 Watts ERP
Azimuthal Directional Pattern:	Non-Directional
Necessary Bandwidth:	6 MHz
Emission Designator:	6M00D7W
Hours of Operation:	24 x 7
Type of Station:	Experimental Digital Television

Equipment

Transmitter Manufacturer:	Thales
Transmitter Model:	Affinity
Antenna Manufacturer:	Kathrein Scala
Antenna Model:	SL-8

Table 2
INTERFERENCE ANALYSIS RESULTS SUMMARY
 prepared for
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Stations Considered	City, State Channel	Distance (km)	Baseline Population (1)	Service Population (2)	--- Unique Interference --- from proposal	
					Population (3)	Percentage (4)
W46BR LIC	MOOREFIELD, WV 46	134.3	----- no interference caused by proposal -----			
W46AE LIC	SOUTHERN ROCKINGHAM, VA 46	137.5	----- no interference caused by proposal -----			
WMDO-CA LIC	WASHINGTON, DC 47	23.2	----- no interference caused by proposal -----			
WNUV LIC	BALTIMORE, MD 54	63.9	----- no interference caused by proposal -----			
W54BG LIC	MOOREFIELD, WV 54	134.3	----- no interference caused by proposal -----			
WIAV-LP LIC	WASHINGTON, DC 58	41.8	----- no interference caused by proposal -----			
W58DK LIC	RUCKERSVILLE, ETC., VA 58	105.8	----- no interference caused by proposal -----			
W59AC LIC	NEW MARKET, VA 59	117.2	----- no interference caused by proposal -----			
WWPX LIC	MARTINSBURG, WV 60	82.9	----- no interference caused by proposal -----			
W60AL LIC	ONANCOCK, VA 60	198.9	----- no interference caused by proposal -----			
W61BY LIC	ANNAPOLIS, MD 61	70.0	----- no interference caused by proposal -----			

Table 2
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Stations Considered	City, State Channel	Distance (km)	Baseline Population (1)	Service Population (2)	--- Unique Interference --- from proposal	
					Population (3)	Percentage (4)
W61AB LIC	NEW MARKET, VA 61	117.2	----- no interference caused by proposal -----			
W61DS CP MOD	SALISBURY, MD 61	136.2	----- no interference caused by proposal -----			
WPPX LIC	WILMINGTON, DE 61	196.0	----- no interference caused by proposal -----			
W61AG LIC	POTTSVILLE, ETC., PA 61	215.8	----- no interference caused by proposal -----			
W61CC LIC	PITTSBURGH, PA 61	278.3	----- no interference caused by proposal -----			
WNET CP	NEWARK, NJ 61	346.8	----- no interference caused by proposal -----			
W61AJ LIC	ANDOVER, NY 61	356.3	----- no interference caused by proposal -----			
WLXI-TV LIC	GREENSBORO, NC 61	392.0	----- no interference caused by proposal -----			
WFPT CP	FREDERICK, MD 62	34.6	3,039,309	1,868,200	0	0.00%
WFPT LIC	FREDERICK, MD 62	38.5	3,250,039	1,916,196	0	0.00%
WWTD-LP LIC	ANNAPOLIS, MD 63	70.0	----- no interference caused by proposal -----			

Table 2
INTERFERENCE ANALYSIS RESULTS SUMMARY

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Stations Considered	City, State Channel	Distance (km)	Baseline Population (1)	Service Population (2)	--- Unique Interference --- from proposal	
					Population (3)	Percentage (4)
W28BY LIC	BALTIMORE, MD 63	74.6	----- no interference caused by proposal -----			
W63AF LIC	WOODSTOCK, VA 63	99.7	----- no interference caused by proposal -----			
WZDC-LP LIC	WASHINGTON, DC 64	28.9	----- no interference caused by proposal -----			
W65AB LIC	WOODSTOCK, VA 65	99.7	----- no interference caused by proposal -----			
WUPV LIC	ASHLAND, VA 65	134.5	----- no interference caused by proposal -----			
W68AB LIC	WOODSTOCK, VA 68	99.8	----- no interference caused by proposal -----			
WJAL LIC	HAGERSTOWN, MD 68	116.8	----- no interference caused by proposal -----			
WQAW-LP LIC	LAKE SHORE, MD 69	95.5	----- no interference caused by proposal -----			
W69AC LIC	ROMNEY, WV 69	124.2	----- no interference caused by proposal -----			

Notes:

- (1) For DTV Stations: Greater of NTSC or DTV Service Population, from FCC Table
For NTSC Stations: Population within noise-limited contour
For LPTV & Class A Stations: Population within the dipole-corrected 74 dBμ contour
- (2) Interference-free service population per OET-69 before consideration of proposal
- (3) Net change in population receiving interference resulting from proposal
- (4) Proposal's impact in terms of percentage, equals (3)/(1) times 100 percent: not to exceed zero when rounded to the nearest whole percent

The determination of stations for consideration and the determination of baseline population and interference percentages were made as described in the Commission's August 10, 1998 Public Notice "Additional Application Processing Guidelines for Digital Television"