

Before the  
Federal Communications Commission  
Washington, D.C.

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FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF THE SECRETARY

In the Matter of	)	
	)	
Amendment of Section 73.622(b) of	)	MM Docket No.
The Commission's Rules, DTV	)	RM No.
Table of Allotments	)	
(Portsmouth, Virginia)	)	

To: The Chief, Allocations Branch:

**PETITION FOR RULEMAKING  
AND REQUEST FOR EXPEDITED ACTION**

1. Viacom Broadcasting of Seattle, Inc. ("Viacom") pursuant to Section 73.623 of the Commission's rules, 47 C.F.R. Section 73.623, hereby requests that the Commission institute a rulemaking proceeding for the purpose of amending the Table of Allotments for the digital television ("DTV") service to change the initial DTV channel allotment for station WGNT-DT, Portsmouth, Virginia, from channel 19 to channel 50. In light of the fact that the Commission had set November 1, 1999, deadline for filing a construction permit for WGNT-DT (Viacom timely requested an extension of this filing deadline), Viacom respectfully requests expedited action on this Petition.

2. Viacom is the licensee of television station WGNT(TV), Portsmouth, Virginia, which currently operates on NTSC channel 27. As the attached engineering exhibit of Hammett & Edison, Inc. indicates, the first-adjacent channel allotments for WGNT-DT and WUND-DT, Columbia, North Carolina, are in such close proximity to one another that each of the stations is the most significant interference contributor within the other station's service area.

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3. In addition to this adjacent channel interference problem, any future power increases by either WGNT-DT or WUND-DT will be severely constrained by the need to protect the service area of the other station.

4. Viacom thus proposes to amend the DTV Table of Allotments to substitute Channel 50 in place of Channel 19 at Portsmouth, Virginia for use of WGNT. As demonstrated in the attached engineering exhibit, the allocation of Channel 50 at WGND-DT's reference coordinates would be fully-spaced pursuant to the spacing criteria for new DTV allocations set forth in Section 73.622(d) of the Commission's rules, 47 C.F.R. Section 73.622(d) and would result in significantly less interference to other stations. Moreover, such a change would eliminate the very real potential for interference between WGNT-DT and WUNDT-DT.

5. Accordingly, Viacom respectfully requests that the Commission expeditiously commence a rulemaking proceeding to amend the DTV Table of Allotments to allot and assign DTV channel 50 (in lieu of channel 19) to Portsmouth, Virginia, to for use by WGND-DT.

Respectfully submitted,

**Viacom Broadcasting of Seattle, Inc.**

By: Raymond A. White  
Raymond A. White  
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November 15, 1999

**Viacom Broadcasting of Seattle Inc.  
Station WGNT-DT  
Portsmouth, Virginia**

**Engineering Exhibit  
in Support of Petition  
for Rulemaking**

November 9, 1999

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## Station WGNT-DT • Portsmouth, Virginia

### Statement of Hammett & Edison, Inc., Consulting Engineers

The firm of Hammett & Edison, Inc., Consulting Engineers, has been retained by Viacom Broadcasting of Seattle Inc., licensee of TV Station WGNT, NTSC Channel 27, Portsmouth, Virginia, to prepare an engineering exhibit in support of its petition for rulemaking to amend the DTV Table of Allotments, Section 73.622(b), to replace the DTV Channel 19 allotment at Portsmouth with DTV Channel 50.

### Background

TV Station WGNT is presently licensed to operate on NTSC Channel 27, serving Portsmouth, Virginia, with omnidirectional transmitting facilities of 2,340 kilowatts peak visual effective radiated power at a height above average terrain (HAAT) of 296 meters. In the *Memorandum Opinion and Order on Reconsideration of the Sixth Report and Order* in MM Docket 87-268, adopted February 23, 1998, the Commission assigned DTV Channel 19 to WGNT, with specified parameters of 60.4 kilowatts average effective radiated power (ERP) at 296 meters HAAT, using a directional antenna pattern derived from the omni-directional operation of the WGNT NTSC facility, adjusted for F(50,90) service at UHF.

In the same proceeding, Station WUND-TV, NTSC Channel 2, Columbia, North Carolina, was assigned DTV Channel 20, with specified parameters of 1,000 kilowatts maximum directional ERP at 302 meters HAAT. The WUND-DT reference site is located 101.8 kilometers from the WGNT-DT reference coordinates

### Predicted Interference on DTV Channel 19

Since the first-adjacent channel allotments for WGNT-DT and WUND-DT are so close, they are each the most significant interference contributor within the other's service area. Calculations performed using the FCC OET-69 interference prediction methodology, described in detail in Figure 1, indicate that interference would be caused by WGNT-DT, as allotted, to 170,829 persons in the WUND-DT service area, and that interference would be caused by WUND-DT, as allotted, to 3,235 persons in the WGNT-DT service area. In addition, any future improvement of transmitting facilities by either station could be severely constrained by the need to protect the service area of the other.

## Station WGNT-DT • Portsmouth, Virginia

### Channel 50 Allocation Conditions

Due to the very real risk of first-adjacent channel interference within the service areas of both WGNT-DT and WUND-DT, it is proposed to amend the Digital Television Table of Allotments in Section 73.622 of the FCC Rules to substitute Channel 50 in place of Channel 19 at Portsmouth, Virginia, for the use of WGNT-DT. Not only would the change in channel result in significantly less interference to other stations, as shown in the summary of OET-69 calculation results in Figure 2, but the allocation of Channel 50 at the WGNT-DT reference coordinates would be fully-spaced pursuant to the spacing criteria for new DTV allocations set forth in Section 73.623(d) of the FCC Rules, as shown in Figure 3.

### Summary

Changing the channel of the DTV allotment for WGNT-DT from Channel 19 to Channel 50 meets the FCC Rules for protection of NTSC operations and DTV allotments from interference, as well as the spacing rules for new DTV allotments, and would eliminate the potential for interference between WGNT-DT and WUND-DT.

### List of Figures

In carrying out these engineering studies, the following attached figures were prepared under my direct supervision:

1. TVIXSTUDY™ methodology
2. Summary of OET-69 interference study
3. Table showing allocation spacing restrictions.



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Daniel G.P. Mansergh

November 9, 1999

**Affidavit**

State of California |  
County of Sonoma | ss:

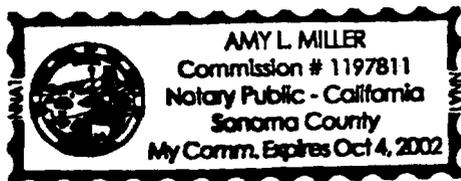
Daniel G.P. Mansergh, being first duly sworn upon oath, deposes and says:

1. That he is a qualified engineer and is employed by the firm of Hammett & Edison, Inc., Consulting Engineers, with offices located near the city of San Francisco, California,
2. That he graduated with honors from the University of California at Santa Cruz with a Bachelor of Arts degree in 1992, completed two years of employment with Apogee Sound, Inc., and has been associated with the firm of Hammett & Edison, Inc., since October 1994,
3. That the firm of Hammett & Edison, Inc., Consulting Engineers, has been retained by Viacom Broadcasting of Seattle Inc., licensee of TV Station WGNT, NTSC Channel 27, Portsmouth, Virginia, to prepare an engineering exhibit in support of its petition for rulemaking to amend the DTV Table of Allotments, Section 73.622(b), to replace the DTV Channel 19 allotment at Portsmouth with DTV Channel 50,
4. That such engineering work has been carried out by him or under his direction and that the results thereof are attached hereto and form a part of this affidavit, and
5. That the foregoing statement and the report regarding the aforementioned engineering work are true and correct of his own knowledge except such statements made therein on information and belief and, as to such statements, he believes them to be true.



Daniel G.P. Mansergh

Subscribed and sworn to before me this 9th day of November, 1999



## TVIXSTUDY™ Analysis Methodology

### Implementation of FCC's Interference-Based Allocation Algorithm

On April 21, 1997, the Federal Communications Commission released its Fifth and Sixth Report and Order texts to Mass Media Docket No. 87-268, establishing a final Table of Allotments for the transition from analog NTSC television service to a digital television ("DTV") service. The Commission utilized a complex set of computerized analysis tools to generate the DTV allotment table and added FCC Rules Section 73.623(b)(2), requiring that similar tools be employed to analyze individual DTV station assignments with regard to their potential interference to other DTV stations, DTV allotments, and existing or authorized NTSC facilities. Those tools were described in FCC OET Bulletin No. 69, *Longley-Rice Methodology for Evaluating TV Coverage and Interference* ("OET-69"), released on July 2, 1997. Subsequent to OET-69, the Commission released, on February 23, 1998, its Memorandum Opinion and Order on Reconsideration of the Fifth [and Sixth] Report and Order[s], which made a number of changes to the previous allotment table and modified several of the analysis methods to be employed for studying DTV allotments and potential facility modifications. On August 10, 1998, the Commission published a text, *Additional Application Processing Guidelines for Digital Television (DTV)*, which provided important clarifications and enhancements to the specified analysis methods. Hammett & Edison has developed and refined the TVIXSTUDY computer software to perform FCC-style DTV allocation studies as based on OET-69, its subsequent clarifications, and also upon a detailed examination of the FCC allotment program software source code.

For most NTSC or DTV stations to be studied, the FCC analysis model first determines the location of the conventional F(50,50) Grade B contour of the NTSC station, or of the NTSC station associated with an assigned DTV station, using pattern information contained in the FCC engineering database and an assumed antenna elevation pattern. The model assumes that contour as an envelope, outside of which no protection from interference is implied or afforded. The location of the Grade B contour was used to determine the assigned power for the DTV station, once again using conventional methods found in FCC Rules Section 73.699, Figures 9 and 10, determining the power necessary on a radial basis to generate the associated DTV coverage contour (41 dBu for UHF, 36 dBu for high VHF Channels 7-13, and 28 dBu for low VHF Channels 2-6), for an assigned DTV channel. The maximum power determined using this method was assigned as the DTV operating power, provided it was calculated to be above established minimum power levels; otherwise, a minimum power level was assigned. By the same token, facilities with calculated DTV power levels above the established maximum power levels for a given channel were assigned the maximum power level. The use of this method usually creates a directional DTV antenna replication pattern, even for DTV assignments to presently omnidirectional NTSC TV stations. The FCC requires that a DTV facility employ an antenna design that meets the calculated replication envelope parameters, unless, with a few exceptions, zero or *de minimus* new interference to other facilities can be demonstrated.

In addition to the use of the Grade B envelope and an assumed directional transmitting antenna for all DTV facilities, the model assumes the use of directive receiving antennas at each studied location, or "cell." The characteristics of the receiving antennas are different, not only for the low



VHF, high VHF, and UHF frequency bands, but also for NTSC and DTV receiving situations; the FCC model specifies that more directive antennas be employed for analysis of DTV reception.

The FCC analysis technique employs terrain-sensitive calculation methods based on Version 1.2.2 of the ITS Irregular Terrain Model, also known as the Longley-Rice model. For each NTSC or DTV station to be studied, a grid of cells, two kilometers on a side, fills the associated Grade B or noise-limited contour. The program first determines which of the cells is predicted to receive service from the associated station, using Longley-Rice analysis with F(50,50) statistical weighting for NTSC and F(50,90) statistical weighting for DTV stations. Cells determined to have no service are not studied for interference from other stations.\* Once cells having service are determined, the software analyzes potential interference from other NTSC or DTV stations, again using the Longley-Rice propagation algorithm and defined statistical weighting for all potential interfering signals. Each cell is evaluated, as appropriate, using the desired-to-undesired ratios and methods presented in FCC Rules Section 73.622, 73.623, and 74.706 for each channel relationship, and cells determined to have interference are flagged and excluded from further study, resulting in the generation of net interference-free coverage population totals.

The TVIXSTUDY analysis program employs all of the OET-69 analysis features described above, as well as several other more subtle elements prescribed by the FCC. Additionally, the program allows modeling of implementation scenarios that involve changes to effective radiated power, antenna height, antenna pattern, channel number, and/or transmitter location. TVIXSTUDY also can identify cells that fall in major bodies of water, as based on digitized map data, excluding them from the study. The program is primarily intended to study the effects of existing/potential NTSC or DTV facilities on other DTV or NTSC facilities, as based on desired-to-undesired ratio parameters defined in OET-69. A typical TVIXSTUDY analysis summary includes technical parameters of the proposed DTV or NTSC facility, along with its original (pre-modification) technical parameters, if any. Also included is a listing of each protected DTV and/or NTSC facility or allotment with associated interference-free population tabulations and the unique interference population resulting from operation of the proposed facility. TVIXSTUDY is similar to the program TVCOVSTUDY, which instead predicts the interference-limited coverage of a selected facility.

The results of the OET-69 algorithm are dependent on the use of computer databases, including terrain, population, and FCC engineering records. FCC Rules §0.434(e) specifically disclaims the accuracy of its databases, recommending the use of primary data sources (*i.e.*, paper documents), which is not practical for DTV interference analyses. Further, while Hammett & Edison, Inc. endeavors to follow official releases and established precedents on the matter, FCC policy on DTV analysis methods is constantly changing. Thus, the results of OET-69 interference and coverage studies are subject to change and may differ from FCC results.

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\* It is noted that the Longley-Rice model is not always capable of determining, within certain confidence limits, whether a particular cell has service. In such cases, the Longley-Rice algorithm returns an error code; the FCC method for handling such error codes is to assume that the associated cells have interference-free service and, as such, are not further considered. The Hammett & Edison TVIXSTUDY program reports the number of such error cells for a given study and provides the option of generating a map showing their locations, which may be useful for further review using other propagation analysis tools.



## Station WGNT-DT • Portsmouth, Virginia

### Results of OET-69 Interference Study

Interference analysis  
tvixstudy 2.3.2

Before case parameters:  
(same as "Original" below)

After case parameters:

	--Modified--	--Original--
Station:	D50 WGNTDT allot	D19 WGNTDT allot
City:	PORTSMOUTH, VA	PORTSMOUTH, VA
Coordinates:	N 36-48-43.0 W 76-27-49.0	N 36-48-43.0 W 76-27-49.0
Height AMSL:	302.0 m	302.0 m
Maximum ERP:	60.4 kW	60.4 kW
Azimuth pattern:	omnidirectional	DTV1528 (replication)
Orientation:		0.0
Elevation pattern:	OET-69 generic	OET-69 generic
Service level:	42.0 dBu	39.2 dBu

Protected station		BasePop 1000s	Before		After		%Chng
			IX Change 1000s	%Base	IX Change 1000s	%Base	
N35 WRLHTV LIC	RICHMOND, VA	1,095	36	3.3	36	3.3	0.0
N35 WRLHTV CP	RICHMOND, VA	1,219	77	6.3	77	6.3	0.0
N43 WVBT LIC	VIRGINIA BEACH, VA	1,343	2	0.1	2	0.1	0.0
N43 WVBT CP	VIRGINIA BEACH, VA	1,573	0	0.0	0	0.0	0.0
N43 WVBT APP	VIRGINIA BEACH, VA	1,523	0	0.0	0	0.0	0.0
D49 WRAZ-DT CP	RALEIGH, NC	1,972	-111	-5.6	-111	-5.6	0.0
D49 WRAZ-DT APP	RALEIGH, NC	1,972	-99	-5.0	-99	-5.0	0.0
D49 WRAZDT allot	RALEIGH, NC	1,972	-2	-0.1	-2	-0.1	0.0
N49 WPXV LIC	NORFOLK, VA	1,349	0	0.0	0	0.0	0.0
N49 WPXV CP	NORFOLK, VA	1,446	0	0.0	0	0.0	0.0
N49 WPXV APP	NORFOLK, VA	1,598	2	0.1	2	0.1	0.0
N50 WBDCTV LIC	WASHINGTON, DC	5,936	2	0.0	2	0.0	0.0
N50 WRAZ LIC	RALEIGH, NC	1,991	99	5.0	101	5.1	0.1
D50 WWAC-DT APP	ATLANTIC CITY, NJ	203	-3,944	-1943	-3,944	-1943	0.0
N57 WCVW LIC	RICHMOND, VA	945	4	0.4	4	0.4	0.0

## Station WGNT-DT • Portsmouth, Virginia

### Allocation Spacing Restrictions

<u>Channel</u>	<u>Call Sign</u>	<u>Status</u>	<u>Location</u>	<u>Required Distance</u>	<u>Actual Distance</u>
35	WRLH-TV	Licensed	Richmond, Virginia	>80.5 km	134.3 km
36	WUNP-TV	Licensed	Roanoke Rapids, N. Carolina	>80.5	135.9
42	WVPY	Licensed	Front Royal, Virginia	>80.5	289.6
43	WVBT	Licensed	Virginia Beach, Virginia	<24.1	16.1
46*	WVFX	Licensed	Clarksburg, West Virginia	>80.5	438.6
47	WRPX	Application	Rocky Mount, N. Carolina	>80.5	173.7
48	WUPN-TV	Licensed	Greensboro, N. Carolina	>80.5	320.7
49	WPXV	Licensed	Norfolk, Virginia	<12.0	3.7
50	WRAZ	Licensed	Raleigh, N. Carolina	>217.3	225.0
51	WBDC-DT	Application	Washington, D.C.	>110.0	243.8
52†	WNJT	Licensed	Trenton, New Jersey	>80.5	415.2
53	WNVT	Licensed	Goldvein, Virginia	>80.5	219.2
54‡	WNUV	Licensed	Baltimore, Maryland	>80.5	276.0
57	WCVW	Licensed	Richmond, Virginia	>80.5	127.6
58	None	Application	Waldorf, Maryland	>80.5	203.3

\* The open allocation at West Point, Virginia, is scheduled to be deleted.

† The open allocations at Courtland, Virginia, and Cumberland, Maryland, are scheduled to be deleted.

‡ The open allocation at Lynchburg, Virginia, is scheduled to be deleted.

