November 2017
Fac. ID No. 703425

Section 5.207 Supplemental Report

A) Number of Hours Operated – Approximately 12,500 hours. With the exception of approximately 10 days, the transmitter has been on air 24/7 since June 29, 2016.

B) Types of Transmitting and Studio Equipment:

Transmit Antenna	Electronics Research Inc. Model ETU-2U7-ES1C5-39
Mask Filter	Electronics Research Inc. UF10000-63 CH39
Transmitter	Gates Air Maxiva UXLT-20 ATSC30
Exciter	Gates Air XTE ATSC30
Scheduler	Enensys HDm-ATSCheduler
Route Encoder & Signaling and Announcement	Triveni GDBRXMLC with ROUTE option
Emergency Alerting decoder/encoder	Monroe Electronics DASDEC
Dash Packager	Keepixo Genova Packager GE-PKG100
HEVC Encoding	Harmonic VIBE 4k-1U-2AC-1CH
HD to 4K upconverter and De-interlace	Teranex EXP12GDL
OTA Receiver	LG Electronics Prototype 4K TV w/ integrated ATSC RF receiver

C) Research and Operation Expenses: In addition to expending significant internal resources on this project, including equipment purchases and the use of WRAL employees, applicant also incurred RF consulting services of approximately $10,000 and legal services.

D) Power Employed: All full time testing continues to be at the full power approved of 40 kW ERP. Applicant conducted as needed field intensity measurements and visual and aural observations.

E) Public Participation:

1) No public viewing, with the exception of viewings at the WRAL-TV main studio location.
2) Speaking engagements have been undertaken to share what has been learned so far:
    a. NAB Super Session in April 2017
    b. IEEE-BTS Broadcast Symposium in September 2017
    c. UNC-PBS presentation to ETAC board.

F) Conclusions: Additional testing is required before applicant can draw conclusive results.

G) Program of Further Developments in Broadcasting: Applicant believes that its ongoing experiments with ATSC 3.0 will contribute greatly to the industry's knowledge base of ATSC 3.0 capabilities, and will help spur further developments.

H) All Developments and Major Changes in Equipment: Applicant believes that additional time is needed in order to determine all developments. See Narrative Statement below.

I) Any Other Pertinent Developments: See Narrative Statement below.

Narrative Statement:

Since the last update in June 2017, the applicant has ramped up testing of various modes of transmission by varying many MOD-COD parameters. Additionally, the applicant has begun testing of Layer Division Multiplexing

Observations:

1) The lack of receivers is still a problem in these early days but see that real options are now on the horizon. In late November 2017, Applicant was able to test the ETRI demodulator, which will allow us to perform measured in-motion tests.
2) In previous updates, we described the current mode of transmission and the number and robustness of various PLPs. In the past six months many different parameters have been tested. The overall testing is proving that the mathematical predictions of ATSC 3.0 parameters are accurate.
3) Additionally, we have begun testing LDM and are finding that the advantages look real. More to come.
4) We have begun working with Consumer Electronics manufactures to share test streams of real-world off-air broadcasts for them to test with their prototype receivers.
5) Testing is also underway in higher level areas of the ATSC 3.0 ecosystem. In studio we are now testing HDR signaling, and participating in APP development with the NAB's Pilot program.

These past six months have been extremely encouraging. With real decoders coming soon and the CE Manufacturers taking a real interest in real world signals, the ecosystem is beginning to fall into place. This technology is robust and amazingly flexible.