

Attachment 1
Northrop Grumman Systems Corporation
Application for Special Temporary Authority

By this application, Northrop Grumman Systems Corporation (“Northrop Grumman”) is seeking special temporary authority (“STA”) to continue through December 31, 2014 the testing and demonstration program that it has been operating under the STA that is set to expire November 2, 2014 pursuant to Call Sign WG9XHQ. That STA has permitted Northrop Grumman to operate a trial 700 MHz Long Term Evolution (“LTE”) network for testing hypothetical first responder communications in and between the New York City metro area and the Northern Virginia metro area outside of Washington, DC (the “Demo Network”).¹ The purpose of the Demo Network is to develop, implement, test and demonstrate how a primary state public safety network operations center (“NOC”), with local content and local control, will interface with a regional network core as part of the First Responder Network Authority (“FirstNet”) nationwide network. The network core in the Demo Network houses and is used to test three critical first responder features to ensure the integrity of the first responder network: (1) identity management; (2) cyber security; and (3) applications delivery.

Overview of the Demo Network. The Demo Network uses 758-768 MHz as the downlink band and 788-798 as the uplink band for the transmission of test local first responder communications in New York and Northern Virginia. One base station is deployed in Northern Virginia (in McLean), and two base stations are deployed in New York City (one in Brooklyn and one in Manhattan).² A fully redundant backhaul link has been deployed to couple the operations in New York and Virginia to a common LTE-evolved packet core. Twenty experimental end-user devices are provisioned for testing and demonstration by Northrop Grumman employees. In New York, the end user devices are operated within a radius of three miles or less of the base stations. In Northern Virginia, the end-user devices are operated indoors at the same location as the base station.³ As they have in the past, FirstNet, licensee of WQQE234, and the Commonwealth of

¹ Northrop Grumman’s trial operations are not, and will not be, used in actual mission-critical operations or in the delivery of live transmissions to protect life, property, or safety.

² Graphic details, including “perspectives” from the two New York City sites and the RF site antenna configuration information for each site were previously provided to the Commission in connection with the application for the current STA and remain unchanged. See FCC File No. 0258-EX-ST-2014.

³ As Northrop Grumman has previously reported to the Commission, it has implemented internal procedures to monitor and maintain control of the handsets and will promptly respond to any reports of harmful interference. Each unit is registered to its recipient, and Northrop Grumman maintains a record of each device so that each can be easily recalled at any time during testing

Virginia, licensee of WPTZ775, the licensees of the spectrum to be used by Northrop Grumman and the only licensees potentially impacted by operation of the Demo Network, have consented to the grant of the STA subject to certain conditions.⁴ A copy of the Commonwealth's consent is annexed as Exhibit 1, and Northrop Grumman agrees to the conditions set forth therein.⁵ Northrop Grumman has also discussed this application with FirstNet, which has indicated to Northrop Grumman that it will communicate its proposed conditions directly to the Commission.

Northrop Grumman has aimed to take every step possible to ensure that configuration of the Demo Network closely resembles the real-world, anticipated architecture of the FirstNet core network. In the Demo Network, the Solutions Center in Brooklyn represents how a primary state NOC, with local content and local control, will interface with a regional network core in the FirstNet network. The Northrop Grumman Innovation Center in McLean models the regional network core. Northrop Grumman's application for its existing STA provide a detailed description of how the Demo Network replicates a nationwide distributed network for FirstNet, including local hubs, regional hubs and the nationwide network core; and how FirstNet can leverage existing commercial and municipal infrastructure for first responders communications through the core network.⁶ In addition to continuing the evolution of the many features described by Northrop Grumman in its earlier filings, Northrop Grumman continues to improve the Demo Network by adding additional features such as its recently implemented location-based technology.

Northrop Grumman's investment to date in the Demo Network is approximately \$3 million.

and when testing is complete.

⁴ With such consents, Northrop Grumman has obtained all government approvals necessary for the continued operation of the Demo Network, save for the Commission's grant of this application.

⁵ The consent of the Commonwealth of Virginia to this application is subject to the following conditions, which are identical to the conditions imposed by the Commonwealth when it consented to the STA under which WG9XHQ is currently operating: STA operations must be strictly limited to the in-building parameters proposed in the application; Northrop must assume all causalities, risks, damages, and liabilities that may result from operations associated with the STA; if Northrop deviates from the terms of the STA, the Commonwealth can revoke its approval of the STA; Northrop will notify the Interoperability Coordinator, the Commonwealth Spectrum manager and the Virginia State Police if any upcoming test associated with the STA deviates from the STA as granted; Northrop also will notify the STARS NOC prior to commencing any test and will only conduct such tests with the concurrence of the Virginia State Police. These coordinating activities have been undertaken by Northrop and the Commonwealth with success relative to the current STA.

⁶ See FCC File No. 0258-EX-ST-2014.

Important Visits by Stakeholders Are Still Occurring. Since the Demo Network first entered its operational phase, Northrop Grumman has hosted at its New York and Northern Virginia sites a variety of important public safety stakeholders. The STA requested by this application is needed: (a) to complete visits by important stakeholders, including FirstNet (some of whom will be visiting for a second or third time to view the improvements Northrop Grumman has made since the Demo Network commenced operations); (b) to complete testing; and (c) to share with FirstNet and the Commission important lessons learned from deployment and operation of the Demo Network. To date, the following stakeholders have visited the Demo Network:

- The Head of the Public Safety Advisory Council – Harlin McEwen
- Association of Public-Safety Communications Officials (APCO) – Jeff Cohen, Roger Wespe
- The Department of Homeland Security (via WidePoint, which was awarded a large BPA contract with the Department of Homeland Security)
- National Institute of Standards and Technology (“NIST”) / Public Safety Communications Research (PSCR) – Dereck Orr and his technical team
- Commonwealth of Virginia Spectrum Manager – David Warner
- The State of Maryland – Ray Lehr and Lori Stone
- The State of Michigan – Brad Stoddard
- LAPD Chief Information Officer
- Deputy CIO from the FBI – Dean Hall
- The CTO of Customs and Border Patrol – Wolf Tombe
- U.S. Army – Combat Training Centers Program Representatives
- The Social Security Administration
- London Metropolitan Police
- Acting FirstNet GM – TJ Kennedy
- FirstNet CTO – Ali Afrashteh
- FirstNet Deputy CTO – Jeff Bratcher
- FirstNet Technical Team
- Department of Justice
- US Marshals Service
- U.S. Postal Service
- U.S. Census Bureau
- Department of Justice
- FCC and NTIA Leaders

Northrop Grumman is working to schedule visits to the Demo Network by the following:

- FirstNet Board Members
- The Mayor’s Office of Citywide Emergency Communications in New York City
- New York Police Department (NYPD)
- Fire Department of New York City (FDNY)

- The Department of Information Technology and Telecommunications in New York City
- FirstNet Statewide Interoperability Coordinators from all 50 states, territories, and 556 tribal nations
- Members of Congress or members of their staff, including: Rep. Greg Walden (R-OR); Rep. Anna Eshoo (D-CA); Rep. John Shimkus (R-IL); Rep. Bob Latta (R-OH); Rep. Leonard Lance (R-NJ); Rep. Jim Matheson (D-UT); Rep. Mike Pompeo (R-KS); and Rep. Renee Ellmers (R-NC)
- FEMA
- U.S. Secret Service
- The Virginia State Police

Further Matters. Northrop Grumman confirms the following:

1. Northrop Grumman understands that any STA granted by the Commission pursuant to this application will have secondary status, and that Northrop Grumman must accept any interference from the licensees of the spectrum and their lessees.
2. To the extent FirstNet or any lessee deploys service over FirstNet's spectrum that suffers harmful interference from Northrop Grumman's operations under the requested STA, Northrop Grumman will, within twenty-four (24) hours of receiving notice of such interference, cure such interference by modifying or, if necessary, ceasing operation of, the Demo Network. Moreover, Northrop agrees that, to the extent the FCC grants STAs to any third parties for use of FirstNet spectrum in the vicinity of the Demo Network, Northrop will work cooperatively with such third parties to coordinate operations without the need for intervention from FirstNet.
3. Northrop understands that FirstNet has the right to monitor its operations.
4. Northrop also understands that if additional time for its trial is needed beyond the requested STA, it will be required to file an application with the FCC and, once again, seek consent from FirstNet and the Commonwealth.

EXHIBIT 1



COMMONWEALTH of VIRGINIA
Office of the Governor

Brian J. Moran
Secretary of Public Safety
and Homeland Security

October 20, 2014

Mr. Royce Kincaid
FirstNet Campaign Director
Northrop Grumman
7555 Colshire Drive
McLean, VA 22102

Re: Consent for Special Temporary Authority

Dear Mr. Kincaid,

On April 29, 2014, the Commonwealth of Virginia, the sole guardian of the 'State' 700 MHz spectrum reference, WPTZ775, provided consent for the Special Temporary Authorization ("STA") currently held by Northrop Grumman Systems Corporation ("Northrop Grumman") (Call Sign WG9XHQ). The current STA expires on November 2, 2014, and Northrop Grumman is filing an application with the Federal Communications Commission ("FCC") for a new STA to continue identical operations of its LTE demo network from November 3, 2014 to May 2, 2015. The Commonwealth endorses Northrop Grumman's application for a new STA subject to the following terms and conditions, which shall be made part of the documentation of this request:

- The resultant FCC license matches exactly to the application and resulting documentation that was supplied in good faith by Northrop Grumman to the Commonwealth of Virginia.
- Operations are strictly limited to ground floor indoor (in-building) operations at 7575 Colshire Drive, McLean, Virginia 22102, unless authorized by the Commonwealth of Virginia. The primary radiator coordinates (Latitude and Longitude) are as stated on the STA:
 - 38 55 17 North
 - 77 12 23 West



COMMONWEALTH of VIRGINIA

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Brian J. Moran
Secretary of Public Safety
and Homeland Security

- The primary radiators under test shall not exceed 1 watt of power.
- It shall be further understood that in consideration of FirstNet's consent to this STA, and the FCC's grant of this STA, Northrop Grumman automatically agrees and consents to all terms and conditions as outlined by the Commonwealth of Virginia in this consent letter. Furthermore, Northrop Grumman assumes all causalities, risks, damages, and liabilities that may result from the operations associated with this STA or any resultant STA associated with this request.
- Any deviation from this agreement will result in revocation of any and all STA's approved by the Commonwealth of Virginia. However, all causalities, risks, damages, and liabilities that may have resulted from the operations associated with any STA associated with this request will still be fully enforced to the maximum extent.
- The Comsearch results from testing the radiators for the LTE demo network to ensure no interference were filed with the FCC on October 18, 2013.
- Absence of these stated terms and conditions from the published STA documentation will null and void the STA endorsement from the Commonwealth of Virginia.
- Northrop Grumman will notify the Interoperability Coordinator, the Commonwealth Spectrum Manager, and the Virginia State Police if any upcoming test associated with this STA deviates from the operations authorized under the STA.
- Northrop Grumman shall notify the STARS NOC prior to commencing any test. Northrop Grumman shall not conduct any test authorized under the STA without the concurrence of the Virginia State Police.



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Should the Commonwealth experience any verifiable interference resulting from operations associated with this STA request, Northrop Grumman and any of its partners or associates will immediately discontinue all operations until the source of the interference is fully mitigated. In addition, Northrop Grumman will supply all equipment and personnel necessary to mitigate the interference to the satisfaction of the Commonwealth of Virginia.

In the event Northrop Grumman must discontinue operations twice because the Commonwealth has experienced verifiable interference from operations associated with the STA, the Commonwealth can revoke and nullify the STA at any time immediately upon notice. Moreover, the Commonwealth of Virginia or its employees will not be held liable for any ramifications that may be associated with an unplanned revocation to this STA.

Sincerely,

A handwritten signature in black ink, appearing to read "Brandon Smith".

Brandon Smith
Statewide Interoperability Coordinator
Secretary of Public Safety and Homeland Security
Office of the Governor of Virginia