ONE WORLD TRADE CENTER: BROADCASTING IS BACK WITH ROHDE & SCHWARZ

White Paper | Version 02.00 | Walt Gumbert

ROHDE&SCHWARZ
Make ideas real

CONTENTS

EXECUTIVE SUMMARY

One World Trade Center, the tallest building in New York City, houses the most prestigious broadcast center in the United States. Eight of the nine broadcast transmitters installed, including WNJU (NBC), WPXN main and aux (Scripps), WNET (PBS), WNYW and WWOR (Fox) and WMBC main and aux (independent), are R&S®THU9evo transmitters used for the stations' primary broadcast from One World Trade Center. Telemundo's WNJU was the first station to move in and launched its over-the-air (OTA) broadcasting from the broadcast center on the 90th floor on June 23, 2017. The center is a collaborative effort led by The Durst Organization and designed to support several television and radio stations.

BROADCASTERS RETURN TO 1WTC: THE JOURNEY BACK TO THE TOP

After 9/11, Lower Manhattan wanted to re-establish broadcasting, and after considering several sites, the new World Trade Center piqued stations' interest. Originally, the Port Authority of New York and New Jersey worked with the Metropolitan Television Alliance before The Durst Organization formed a joint venture with the Port Authority to bring broadcasting to 1WTC. It took seven years to complete, with the licenses being signed in 2015 after conducting tests earlier that year. The broadcast center supports all 11 TV and 21 FM radio stations on the market, and there are three liquid loops moving around the facility to maintain comfortable temperatures. The environmentally friendly facility has a 13.8 kV generator for electric power with a highly efficient feed system. WNJU was the first to be installed, and faced some growing pains, but the experience laid the groundwork for future installations.

COLLABORATIVE ENGINEERING EFFORTS BEHIND 1WTC'S SUCCESS

1WTC was a carefully planned broadcast facility that replaced the original World Trade Center. Unlike most other broadcast locations, which have individual antennas for each station, 1WTC has a master broadcast antenna system that allows any broadcaster to operate from the centralized facility without installing a new antenna. The facility can accommodate all the UHF and VHF television broadcasters on the market, and can also handle all the FM radio stations if necessary. Since the center doesn't have any offices, all the transmitters are remotely controlled. The Port Authority of New York and New Jersey provided valuable assistance in the collaborative project. The facility was modeled in 3D using the Autodesk Revit building information modeling software, enabling the broadcast system to be seamlessly integrated into the building's infrastructure.

BROADCASTING REACHES NEW HEIGHTS WITH 1WTC'S SOLID-STATE UHF TRANSMITTER

The powerful and efficient WNJU transmitter in 1WTC is the largest solid-state UHF transmitter ever built, with a liquid cooling system that eliminates noise and reduces the need for excessive air conditioning. Rohde&Schwarz also designed a custom liquid cooling solution to control the temperature of all equipment in the broadcast center.

TOP OF THE WORLD: THE 1WTC ANTENNA TAKES CENTER STAGE

Todd Loney, RF Consultant, handled the project management and supervision of the installation, testing and commissioning of the transmitter and antenna systems for the 1WTC project. This included the installation of a flexible panel antenna capable of full circular polarization, which enables broadcasters to deliver better reception to mobile devices, particularly in urban environments. The project also featured the installation of a solid-state transmitter that is the largest of its kind and has a much smaller footprint than traditional IOT transmitters with the same power density. The antenna installation was complex due to the site's location and security concerns, but was completed within four months. The broadcast center in 1WTC provides a formidable and flexible transmission facility for stations in the USA's largest broadcast market.

INSTALLING TRANSMISSION EQUIPMENT IN 1WTC REQUIRES CAREFUL COLLABORATION

To future-proof the site for the upcoming ATSC 3.0 standard, Myat, Inc. worked with The Durst Organization and RFS to ensure the 1WTC system was able to handle the higher voltage capacity. Myat also carefully planned how to transport and store the components for the project, given the limitations of the building's elevators and minimal storage space. The company worked closely with The Durst Organization, the construction management team and labor unions to deliver the required materials on time. The Rohde&Schwarz transmitter for WNJU was shipped on schedule and held at Myat's facility until 1WTC was ready for it. Myat will continue to work with broadcasters who join WNJU in 1WTC, including providing logistical support for the installation of other Rohde&Schwarz transmitters at the site.

ROHDE&SCHWARZ: THE TOP CHOICE FOR 1WTC'S TRANSMITTER NEEDS

WNJU's transmitter in 1WTC was supplied by Rohde&Schwarz and is the largest solid-state digital transmitter in the world. The six-rack R&S®THU9evo delivers output power of 106 kW and is being shared by WNJU and WNBC. Solid-state transmitters are favored thanks to their reliability, stability and minimal maintenance costs. With its built-in redundancy and ability to deliver 50 kW for both vertical and horizontal polarization, the transmitter allows WNJU and WNBC to provide cutting-edge services for mobile devices.


GLYCOL SUPPLY
GLYCOL RETURN
GLYCOL SUPPLY
GLYCOL RETURN
RACK6

Rohde&Schwarz

The Rohde&Schwarz technology group is among the trailblazers when it comes to paving the way for a safer and connected world with its leading solutions in test&measurement, technology systems and networks&cybersecurity. Founded more than 85 years ago, the group is a reliable partner for industry and government customers around the globe. The independent company is headquartered in Munich, Germany and has an extensive sales and service network with locations in more than 70 countries.

www.rohde-schwarz.com

Rohde&Schwarz customer support

www.rohde-schwarz.com/support

PD 5215.7522.52 | Version 02.00 | March 2023 (ch) | White Paper
One World Trade Center: broadcasting is back with Rohde&Schwarz
Data without tolerance limits is not binding | Subject to change

5215752252
5215.7522.52 02.00 PDP/PDW 1 en