DOES YOUR RF SYSTEM HAVE THE PEAK POWER & INCREASED BANDWIDTH TO DELIVER NEXTGEN TV?

TRUST DIELECTRIC TO HELP YOU CONVERT TO ATSC 3.0.

NEXTGEN TV, based on the ATSC 3.0 standard, is the new wave of broadcasting designed to greatly enhance over-the-air services for viewers. It provides new options through smart TVs and other Internet-connected devices: 4K video, targeted ads and mobile device reception. Our industry-leading engineers will help you navigate the process of converting to ATSC 3.0.

START WITH THIS RF SYSTEM CONSIDERATIONS CHECKLIST:

PEAK POWER CAPABILITY OF COMPONENTS

- ☐ Safety factor of the bandpass filter
- ☐ Safety factor of the coaxial and waveguide low pass filters

BANDWIDTH OF CHANNEL FILTERS

- ☐ Measured bandwidth of filter
- ☐ Should carrier reduction be considered

REMOVAL OR REPLACEMENT OF RF EQUIPMENT

- ☐ Are there any RF components that have been abandoned in place that should be removed?
- ☐ Comparison of costs associated with existing system versus new system

RF SYSTEM SERVICE/SWEEP

- ☐ Last time the RF system was serviced/swept
- ☐ Overall system VSWR performance

COMPATIBILITY OF COMPONENTS

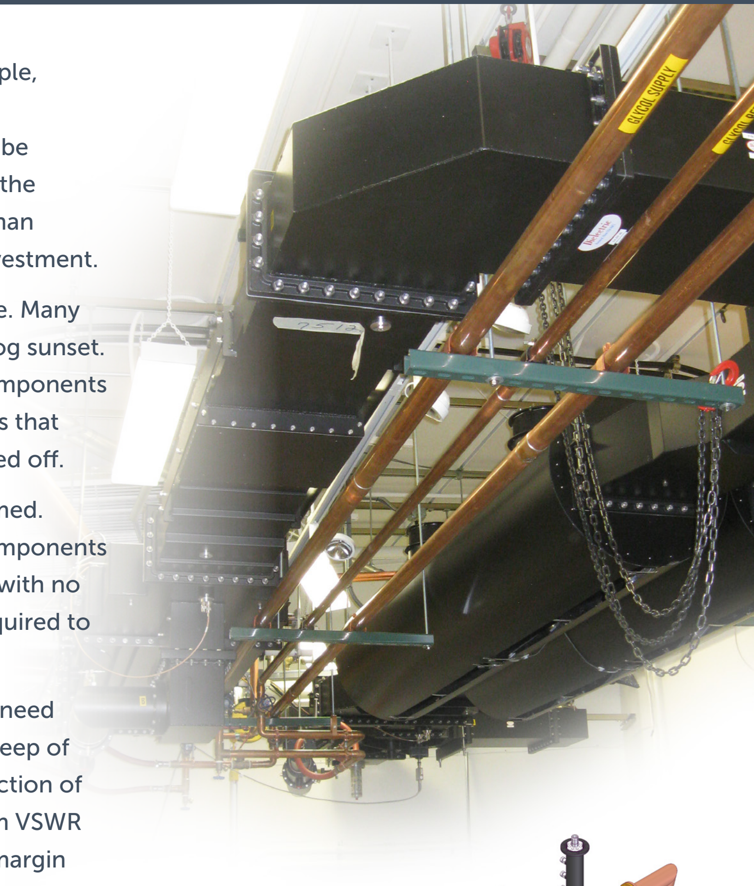
- ☐ Ensure level of filtering is acceptable
- ☐ Does the RF system provide appropriate interlock and RF monitoring points?

FOR DETAILED RF CONSIDERATIONS, SEE REVERSE.

RF SYSTEM CONSIDERATIONS FOR ATSC CHANGE

THE CHANGE FROM ATSC 1.0 TO ATSC 3.0 HAS TWO MAJOR CONSEQUENCES FOR BROADCASTERS:

1. **The increase in peak power—**Most RF system components have ample peak power headroom to accommodate the format change, but filters may be the exception. Older filters were not designed anticipating the higher peak levels of ATSC 3.0—and some filters, especially 8 pole channel bandpass filters or Sharp-tuned filters,will likely need replacing. Keep in mind that it is not uncommon to have multiple levels of low pass filtering - a primary coaxial low-pass filter and a supplemental waveguide low-pass filter. If the safety factor is less than the manufacturer recommends, replacement is strongly recommended.
2. **The increase in occupied bandwidth—**ATSC 1.0 used approximately 5.38 MHz of the allocated channel; ATSC 3.0 will use up to 5.83 MHz. This doesn't like a huge difference and many of the channel bandpass filters do have the required extra bandwidth to pass the full ATSC 3.0 band, with two exceptions: adjacent channel combiners. and some highly selective, sharp-tuned filters. Early adjacent channel combiners used the channel guard band at the edge of the channel to improve the isolation between the combined channels. Sharp-tuned filters were widely used as channel filters, and were designed to provide a considerable amount of rejection of the shoulder energy. Before ATSC 3.0, these also used part of the guard band on the channel edge as the filter transitioned from the passband to the rejection band of the filter. Broadcasters should review original data, if available; if significant roll-off in the ATSC 3.0 band is seen, filter replacement is recommended to retain full channel data capacity for potential future revenue streams.



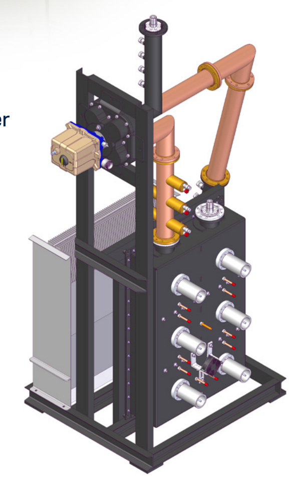
After repack, broadcasters seeking to replace IOT transmitters, for example, would understandably look to reuse all or part of the existing RF system. However, some components of the system will almost certainly need to be replaced. In addition, a number of potentially serious issues could make the integration of a new transmitter with the old RF system more complex than expected—eroding any potential savings on such a significant capital investment.

Transmissions sites have undergone significant change in the last decade. Many have decommissioned systems as result of the Repack, or even the analog sunset. You should strongly consider removing any decommissioned system components in the active RF path of the current system, especially channel combiners that may still be in place with unused channel ports now terminated or capped off.

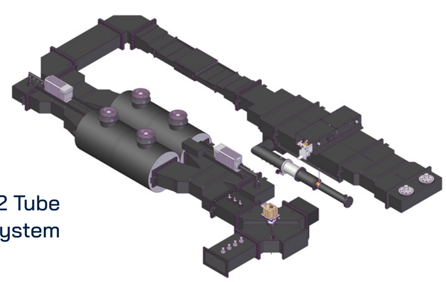
The safety margin of these unused components also needs to be confirmed. A breakdown or high VSWR level in an RF component stresses all the components between it and the transmitter. There is a serious risk that a component with no current purpose in a system might damage an expensive component required to remain on air.

High-power combining, filtering and switching systems are designed to need little maintenance, but this is not the same as no maintenance. An RF sweep of the system should be performed on a regular basis to provide early detection of any component drift or damage. During the RF sweep, the overall system VSWR should be optimized. A high VSWR level will quickly degrade the safety margin of all the components between the mismatch and the transmitter.

Dielectric recognizes the attractiveness of the proposition to re-use RF components and will work with broadcasters and transmitter manufacturers to identify when this is practical and cost effective.



10 kW Reflective Filter with Output Switch



WR 1500 2 Tube DTV RF System

Dielectric.com

Raymond & Lewiston, Maine
(800) 341-9678