CENTURION

RF & STC TESTING

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RF AND STC TESTING

PROTECT YOUR PRECIOUS ASSETS

WHAT ARE "RADIO FREQUENCIES"?

At their core, radio frequencies are simply electrical currents. Like sound waves, electrical currents pulse, or oscillate, at certain speeds; the rate, at which currents pulse, in cycles per second, is called its frequency (or Hertz, abbreviated Hz). Radio frequencies, and the specific uses allowed at each frequency, are regulated by the government.

THE IMPORTANCE OF RF ENERGY

Energy that falls into the spectrum described above, or RF Energy, has a number of special properties. For our purposes, the most important property is that the energy in an RF current can radiate from a conductor into free space as electromagnetic waves (radio waves). While this concept is the basis for directed wireless communication (your AM\FM radio, Wi-Fi, Cell phone, etc.), RF energy is also created in many other ways.

RF energy is generated by most standard equipment used in today's workplace. Computer chips (microprocessors), monitors, printers, wires: all generate signals that can be monitored, recorded, and reconstructed. Computers are already an indispensable part of the modern world; as they become smaller, lighter, and more capable, the signals that they can generate are also receiving more scrutiny.

INTERNAL AND EXTERNAL

The federal government of the United States has recognized the threat posed by RF energy emanating from equipment inside office space and work facilities. Modern eavesdroppers do more than stand around the corner listening to your conversation; sophisticated agents can monitor electronic communications from a great distance. For this reason, government facilities are required to protect themselves through a variety of technical security countermeasures designed to reduce or eliminate the ability of RF energy generated inside the facility to leak out and thus be exploited.

Problems caused by RF energy are not one-way concerns. Sensitive electronic equipment can be interfered with and sometimes even damaged by external signals; directed energy can be used to "flood" an area for eavesdropping and "denial of service" purposes. Adherence to FCC guidelines is important to ensure that the intentional and unintentional RF energy within a space or area, remains within limits to ensure peak operability and safety for equipment and personnel. For this reason, many companies who operate such equipment, or who electronically store and process sensitive information, often choose to survey the potential location(s) before building a new facility.

The range of frequencies usually being referred to when one speaks of radio frequencies, or RF, is between approximately 3,000 Hz (3 kHz) and 300,000,000,000 Hz (300 GHz).

It should be noted that this range includes much more than your standard AM/FM radio, which operates between approximately 300 kHz and 300 MHz.

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THE PURPOSE OF RF TESTING ON FACILITIES

RF tests are generally performed for two reasons: to assess a barrier's ability to attenuate RF energy; and to determine the ambient levels that exist in an area. These tests are performed in the field, with specialized equipment used to generate signals at specific frequencies and strengths, as well as equipment to observe and record signals.

TESTING GOALS

The goal of the tests performed was to determine the attenuation or shielding effectiveness of this area or facility during the final fit up stage of construction to address/outline any discrepancies or areas of improvement that might be required to ensure the completed facility will provide enough RF attenuation to meet shielding effectiveness requirements. Determine if the any metallic penetrations and cable egress points are a source and pathway for unintended signal to exit/enter the area. Generate a report reflecting the achieved attenuation.

TEST(S) PERFORMED

RF attenuation is measured utilizing a swept multipoint frequency test (400MHz – 6GHz). A brief explanation of these tests follows:

- Reference Test - Performed in open area with no obstruction between the transmitting and receiving antennae, and is primarily intended to confirm proper equipment functionality and calibration. This is the baseline test to measure the readings at each frequency point in respect to un-obstructed free space measurement to determine the actual attenuation of the Subject Under Test (SUT). A comparison of these measurements to those achieved during the subsequent Data Tests at the same test points will be completed. This test is performed once for each series of tests that will utilize the same antenna separation distance, power, test equipment and frequency spectrum.

- Data Test - Performed with both the transmitting and receiving antennae functioning. The transmitting antenna is placed inside the space being tested, and the receiving antenna is placed outside the space at the same distance that the reference test utilized for antenna separation.

The test point measurements taken during the Data Test will be subtracted from the baseline test (Reference Test) to determine actual attenuation that the barrier is providing. This test is performed on each wall/barrier that is tested during the evaluation (RF attenuation testing).

- Ambient Test - Performed with only the spectrum analyzer and receive antenna and measures the amplitude and frequency of any detectable signals in the frequency range under test. The transmitting antenna does not operate during this test. This test determines whether any signals generated outside the space interfere with the Reference and Data tests and how these signals can penetrate the facility under test. This test is performed at each Data Test location at the exact point where the receive antenna was positioned for that test.

- Walk-Away Test – Performed by measuring the signal at the prescribed distance for the Reference and Data tests, then moving farther away in 10 meter increments to find the "drop off" point for signal reception. This test is performed on a smaller spectrum with reduced resolution bandwidth for speed and accuracy. The lower, middle and upper portions of the SUT may be tested separately