***In this case, the power output is the "pulsed power" delivered by the pulse generator to the antenna structure and represents a maximum value for the transmitter. The maximum voltage delivered to the antenna terminals by the pulse generator is on the order of 300 kV. Assuming a terminal impedance of 50 ohms, this gives a maximum peak power to the antenna terminals of:***

$$P_a = \frac{\left(3 \cdot 10^5\right)^2}{50} = 1.8\ GW$$

***The radiation efficiency of the unit is expected to be quite low since the antenna is excited not with a sinusoidal signal but rather a pulse. In addition, the matching between the source and antenna has not been fine-tuned as the transmitter is in its early stages of development. For the source/dipole combination used, the vendor quotes a maximum peak field value of 300 V/m on boresight at a range of 100 meters. The radiated power, then, can be calculated as:***

$$P_{r,\max} = \frac{\left|E_r\right|^2}{Z} r^2\, \Omega_A,$$

***where, $E_r$ is the peak electric field at range, r, and $\Omega_A$ is the beam solid angle, and Z is the characteristic impedance of free space, 377 ohms.***

***The beam solid angle is given by,***

$$\Omega_A = \frac{4\pi}{D}$$

***so that,***

$$P_{r,\max} = \frac{\left|E_r\right|^2}{Z\ D} 4\pi r^2$$

***For the half-wave dipole, directivity D = 1.64 ("worst case"). Solving for the radiated power (effective radiated power referenced to a $\lambda/2$ dipole), we find***

$$P_{r,\max} = 18.3 MW$$