NONIONIZING RADIATION COMPLIANCE
Journal Broadcast Corporation

The applicant will take appropriate steps to insure that the operation of the temporary fixed transmit/receive earth station facilities proposed in the attached application fully complies with the FCC's nonionizing radiation exposure standard at all times it is in operation. The antenna for this earth station is a 1.5 meter diameter steerable dish which is permanently affixed to the back of a truck with the center of this dish located at a height of 3 meters above ground level. This earth station will transmit in the 14.0 to 14.5 Ghz band with a maximum transmitter power of 94.84 watts, which will yield a maximum total main beam EIRP of 64.77 dBw from this antenna system. Under normal operating conditions, this antenna will operate at elevation angles ranging from 15° to 50°. In this frequency range, the maximum permitted power density for uncontrolled exposure is 1 mW/cm^2, while the maximum permitted power density for controlled exposure is 5 mW/cm^2.

The procedures and calculation techniques employed to evaluate the power density levels in the vicinity of an aperture antenna, such as the proposed earth station antenna, are outlined on Pages 27 through 31 of the August, 1997 edition of FCC OET Bulletin 65. The analysis of such an antenna is divided into four regions - the antenna surface, the near field region, the transition region, and the far field region.

The maximum power density at the antenna surface is calculated using Equation 11, found on Page 28 of this OET Bulletin. Substituting the appropriate values from above into this equation yields a maximum predicted power density of 21.5 mW/cm^2 at any location on the surface of this antenna. Since this exceeds the permitted power density for both controlled and uncontrolled exposure, it will be necessary for the appli-

cant to insure that no persons are in proximity to the surface of this dish while it is in operation.

Based on Equation 12, also found on Page 28 of this OET Bulletin, the near field region for the main beam of this antenna extends to a distance ranging from 26.3 meters to 27.2 meters over the frequency range involved. Using Equation 13 found of Page 29 of this bulletin and a measured aperture efficiency of 0.67, the maximum power density which will exist anywhere in the near field region of the main beam of this antenna is predicted to be 14.4 mW/cm^2, which still exceeds the maximum permitted level for both controlled and uncontrolled exposure.

In the main beam of the antenna, the transition region begins at the end of the near field region and, from Equation 16 found on Page 30 of this OET Bulletin, extends to a distance ranging from 63 meters to 65.3 meters from the antenna over the range of frequencies involved. Using Equation 17, also found on page 30 of this bulletin, it was determined that the predicted main beam power densities in the transition region will range from the near field maximum of 14.4 mW/cm^2 at the portion of this region closest to the antenna to a minimum of 6.0 mW/cm^2 at the far end of this transition region. Based on this data, the predicted main beam power density for this facility will also exceed the permitted values for both controlled and uncontrolled exposure over the entire length of the transition region.

As outlined on Page 31 of this OET Bulletin, however, "...in the near field and transition regions it can be assumed that, if the point of interest is at least one antenna diameter removed from the center of the main beam, the power density at that point would be at least a factor of 100 (20 dB) less than the value calculated for the equiva-

lent distance in the main beam." Based on this information, the power density calculations outlined above for the near field and transition regions represent the maximum power density predicted to occur within a cylinder centered around the main beam of the antenna and extending from the antenna to the end of the transition region. At all locations outside this cylinder, the maximum predicted power density will not exceed 0.144 mW/cm^2 (1/100th of the maximum predicted power density within this cylinder), which is well below the permitted exposure level for both controlled and uncontrolled exposure. Thus, so long as the applicant restricts access to the top portion of this truck, where the antenna is mounted, and also to all areas in the vicinity of this uplink truck where any portion of this cylinder lies within two meters of ground level, it will not be possible for any person in the vicinity of this uplink truck to be exposed to power densities exceeding the permitted level for either controlled or uncontrolled exposure. Based on the lowest elevation angle of 15° which will be employed during normal operation, and the fact that the top of the truck is 3 meters high, the operator only needs to restrict access to the roof of the vehicle during times when the transmitter is in operation, to insure compliance in the immediate vicinity of this vehicle.

Since the predicted main beam power density at the end of the transition region is still in excess of the permitted level for both controlled and uncontrolled exposure, it was necessary to conduct further calculations utilizing Equation 18, found on Page 30 of this OET Bulletin to evaluate the maximum distance in the main lobe of this antenna in the far field region at which power densities exceeding those permitted for uncontrolled exposure would occur. These calculations determined that the predicted power density in the main beam of this antenna will exceed the permitted level for uncontrolled exposure

out to a distance of 154.5meters (507 feet) from this antenna. Thus, in order to insure compliance with this exposure standard at distant locations within the main beam of this antenna, it will also be necessary for the applicant to insure that there are no buildings or other occupied structures located in the main beam of this antenna out to a distance of 154.5 meters from this antenna.

The applicant will take the necessary steps to restrict access to the areas outlined above at which excessive power density levels are predicted to occur. By doing so, the applicant will insure that this uplink facility will fully comply with the FCC's nonionizing radiation exposure standard when this uplink facility is in operation.