USE OF THE UPPER PART OF THE 13.75-14.0 GHZ BAND. APPLICATION OF ITU-R S 1712 TO EACH TRANSMITTING LOCATION TO SHOW HOW THE NAVY RADARS ARE PROTECTED.

In this case the demo will be performed in Ashburn (Virginia). Here below the Recommendation ITU-R S 1712 is applied to show how the Navy Radars are protected from transmissions from Ashburn; confirming the compliance with the pfd limit criteria of Radio Regulation footnote 5.502.

APPLICATION OF RECOMMENDATION ITU-R S 1712 (METHODOLOGIES FOR DETERMINING WHETHER AN FSS EARTH STATION AT A GIVEN LOCATION COULD TRANSMIT IN THE BAND 13.75-14.0 GHZ WITHOUT EXCEEDING THE PFD LIMITS IN RR502, AND GUIDELINES TO MITIGATE EXCESSES) TO AN EARTH STATION LOCATED IN ASHBURN (VIRGINIA)

- Earth station location: Ashburn (39º 3’ 38’’ N, 77º 27’ 48’’ W), located 221.3 Km inside the coastline
- Earth station height above mean see level: 130 m
- Antenna diameter: 1.2 m
- On axis earth station antenna gain: 43.3 dBi
- Off axis angle to the low-water mark in elevation and azimuth exceeds 48º, then the antenna gain toward the coastline is –10 dBi
- Earth station transmitting e.i.r.p: 49.3 dBW
- Carrier bandwidth assigned: 4 MHz

Input power density of the carrier into de antenna (Pd):

Pd = 49.3 dBW – 43.3 dBi = 6 dBW/ 4 MHz

Transmit e.i.r.p. density within 10 MHz bandwidth toward the coastline ((e.i.r.p.)d):

(e.i.r.p) d = 6 dBW –10dBi = -4 dBW/10 MHz

Method 1, Step A of ITU-R S 1712 (Flat Earth model and path assumed in line-of-sight)

Using the line-of sight curve in Figure 4 of ITU-R S 1712 to determine the minimum separation distance as a function of earth station e.i.r.p/10 MHz radiated by the station toward the low-water mark, it can be seen that for a figure of **–4 dBW/10 MHz** the minimum separation distance should be around **120 Km.**

In this case, the actual path length is greater than the required minimum separation distance, therefore, Step A shows that this transmitting earth station located in Ashburn complies with the pfd limit criteria of RR 5.502.