

RFI SERVICES

**TV Reception Survey
Summerhaven Wind Farm
January 29, 2014**

for

NextEra Energy Resources

Ontario, CA

BACKGROUND

Area residents believe NextEra Energy's Summerhaven Wind Energy Center Wind Turbines are causing TV station signals to be too weak to produce satisfactory TV reception. NextEra Energy requests that I investigate and determine the reason for Poor TV reception.

INVESTIGATION OBJECTIVE

The objective of the investigation was to visit the area residents complaining of poor TV reception, and if poor reception is found to be an issue, figure out the cause.

The two main deliverables for the investigation were:

1. Determine if NextEra Energy is the cause of Poor TV reception.
2. Work with the area residents to identify the cause and make recommendations for the correction.

INVESTIGATION METHODS

I used a Radar Engineers Interference Locating Receiver Model 242 and Model 243 instruments, Channel Master 3619 TV antenna with a 50 foot telescopic mast and a Samsung H5000 TV to view the TV reception as would be viewed in the residence homes.

RESULTS AND OBSERVATIONS

Investigations were made daily between January 26 and January 29, 2014.

During the field investigations the following observations were made:

Date	Observations and Activities
01/26/2014	I picked 5 locations around the area to perform TV reception surveys. These were the four corners of the Turbine areas and one in the middle of the area. This would allow me to see the TV signals looking in all direction toward Toronto CA, Hamilton CA, Erie PA and Buffalo NY.

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	<p>The TV was setup in the rear of my truck using a Color Ray 3619 (Fringe area range) antenna connected to the TV via RG6 Coax cable. I used the TV signal level meter versus a spectrum analyzer to simplify the measurements making it easier for the residence to relate to my measurements. My readings will be comparable to the types of signal level meter used on their TVs.</p> <p>During the signal level testing I found Pixelating to start when the TV signal level was at 45% and lower. Above 50% Pixelating was not noticed. All the systems I made adjustments to had levels high enough to achieve optimum TV reception.</p> <p>Test 1 SE, Sweets CNR Rd & Lake Shore Rd</p> <p>Test 2 NE, Talbot RD & Reeds Rd</p> <p>Test 3 Center, Concession 4 & Cheapside Rd</p> <p>Test 4 NW, Cockshutt Rd & Thompson Rd E</p> <p>Test 5 SW, Rainham Rd & Riverside Dr.</p> <table border="1"> <thead> <tr> <th><u>Ch</u></th> <th><u>Location</u></th> <th><u>Signal Level (% of scale)</u></th> </tr> </thead> <tbody> <tr> <td>4-1</td> <td>Buffalo</td> <td>80%</td> </tr> <tr> <td>5-1</td> <td>Toronto</td> <td>100%</td> </tr> <tr> <td>6-1</td> <td>Toronto</td> <td>100%</td> </tr> <tr> <td>7-1</td> <td>Buffalo</td> <td>100%</td> </tr> <tr> <td>11-1</td> <td>Hamilton</td> <td>100%</td> </tr> <tr> <td>19-1</td> <td>Toronto</td> <td>90%</td> </tr> <tr> <td>23-1</td> <td>Buffalo</td> <td>90%</td> </tr> </tbody> </table>	<u>Ch</u>	<u>Location</u>	<u>Signal Level (% of scale)</u>	4-1	Buffalo	80%	5-1	Toronto	100%	6-1	Toronto	100%	7-1	Buffalo	100%	11-1	Hamilton	100%	19-1	Toronto	90%	23-1	Buffalo	90%
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	<p>31-1 Buffalo 100%</p> <p>41-1 Toronto 80%</p> <p>All locations had very close to the same levels per channel.</p>
<p>01/27/2014</p> <p>Through</p> <p>01/29/2014</p>	<p>I arrived at the NextEra Energy Office and met with Ray D. We performed a Tailgate meeting to discuss my course of action and exchanged telephone numbers and the course of action should an emergency occur.</p> <p>On Site</p> <p>All residents describe the same symptoms caused by non-acceptable signal levels which are TV picture pixelating, freezing and disappears. The audio makes blipping sounds and sometimes the audio and video is totally gone.</p> <p>The antennas were mounted in the attic, on towers, on the roof and one inside the garage under a steel roof. A few had signal amplifiers to enhance the antennas performance if needed.</p> <p>I tuned to each channel they had programmed in their TV and rotated the antenna for best reception for every channel. I recommended they recorded the direction of each channel so they can optimize the reception when the channel is changed. All channels were perfect and the levels were very close to the levels of my test and none more than 5% lower than the level I got at my test points. I explained during very bad weather the signal levels could be a little lower and an antenna amp would solve this issue should it occur.</p> <p>One customer used an antenna in the attic connected to one TV with an amplifier. The signal level on all channels was a max of 30% and often 0%. I disconnected the amp and the signal increased intermittently. I connected my amp and it shut down as well. This is an indication of a problem in the coax, balun or antenna. I found the coax to be RG59 which is a high loss coax and suspect there is a defective connection between the TV and the antenna that may be a contributing factor.</p>

Date	Observations and Activities
	<p>I offered to perform system tests and make repairs as needed but my offer declined and he stated he will make the repairs himself.</p> <p>Some rotors didn't work and they didn't know the direction the antenna is pointed.</p> <p>One resident said "Canadian stations are weakest and he doesn't feel he should have to do anything to improve his signal".</p> <p>He is using an outdoor RV antenna mounted inside of his garage at five feet above the floor at the south facing wall. His roof is steel which has a negative effect on the reception level. His antenna is directional but the rotor is broke and he doesn't know where it was pointing when it broke.</p> <p>This customer has a weak signal on all channels and none are above 60%. I suggested an outdoor home style antenna mounted outside and he mount the antenna on the backside just below the roofs ridge and it wouldn't be seen, he said he has moved his antenna outside and it improved the signal but he doesn't like the look of an antenna outside.</p> <p>He stated his TV signal fade is in sync with the Turbines blade rotation, this is not true. I timed the rotation and the signal fade was very intermittent. He then agreed his claim was not a fact.</p> <p>I told him I feel if the antenna he has was repaired and mounted outdoors above his roof he would then have the minimum antenna signal needed to get a satisfactory TV signal. I also explained that he is in a fringe area for the TV stations (at best) and should consider a better performing antenna. I also asked him to allow me to put my antenna up 50' in the air next to his garage so he could see the results of utilizing a good antenna and he refused. I gave him my card and asked him to call me on the 28th if he changes his mind.</p>
	<p>Another resident said he had weak signal issues last night because of the turbines. I pointed out that the wind is in the same direction as last night and the blades are turning at maximum so if that affected the signal it should be the same. He agreed. His TV signal was better this morning and he agrees the state of the turbines hasn't changed. He also has a malfunctioning rotor so he can't</p>

Date	Observations and Activities
	<p>change the direction of his antenna. As it turns out he started losing TV reception when the stations went digital 2 years ago not when the turbines were installed. He agrees the signal problem is caused by his antenna and will have repairs made to rectify the issue.</p>
1/29/2014	<p>The wind is very strong today and the blowing frost is pretty thick.</p> <p>The last resident on my list had a tower mounted antenna with a rotor. I showed her how to set rotor to the strongest signal and she is quite pleased. We discovered that her antenna is loose at the mast clamp and needs to be tightened. She also is very pleased for the lesson and thankful that I was hired.</p> <p>I went to the locations of Test 2 & 5 and due to the wind and frost I couldn't raise the antenna to the elevation of 50' as in the previous test. At about 20' above ground the signal levels were considerable lower by as much as 20%. This is due to the test antenna being lower and the visibility/signal's line of site being attenuated. I expected this and didn't re-test the other sites. I raised the antenna but found it very difficult and dangerous to handle do to the weather conditions. However raising the antenna did increase the signal level.</p>

CONCLUSION

All customers had the same complaints and symptoms and agree on how to solve the problem. Everyone that has a working rotatable antenna has the problem totally resolved. Two of the residents visited need antenna system repairs. All the trouble symptoms they described were eliminated by pointing the antenna directly at the station and all the customers I worked with were very pleased except one, who was not willing to incorporate my recommended changes.

My tests concluded that the signal levels at all locations were above the level needed to achieve the best quality TV signal and Summerhaven Wind Farm had no influence on the TV reception with any of the concerned residence.

It was a pleasure serving you and if I can assist you in anyway please feel welcome to call me.

Sincerely, all but one

RFI Services

Michael C. Martin

A handwritten signature in black ink that reads "Michael C. Martin". The signature is written in a cursive style with a large initial 'M' and a stylized 'C'.