

NPR Labs HD Radio[®] Power Calculator

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Nautel User's Group Conference

IBOC Power Allowance Calculator

▶ FCC's 2010 *Order*

- Approved blanket upgrade to -14 dBc
- Recognized possibility of 1st-adjacent interference (provided remediation technique)
- Allows up to -10 dBc, if sufficient protection to 1st adj. neighbors

▶ FCC approval of asymmetrical transmission imminent

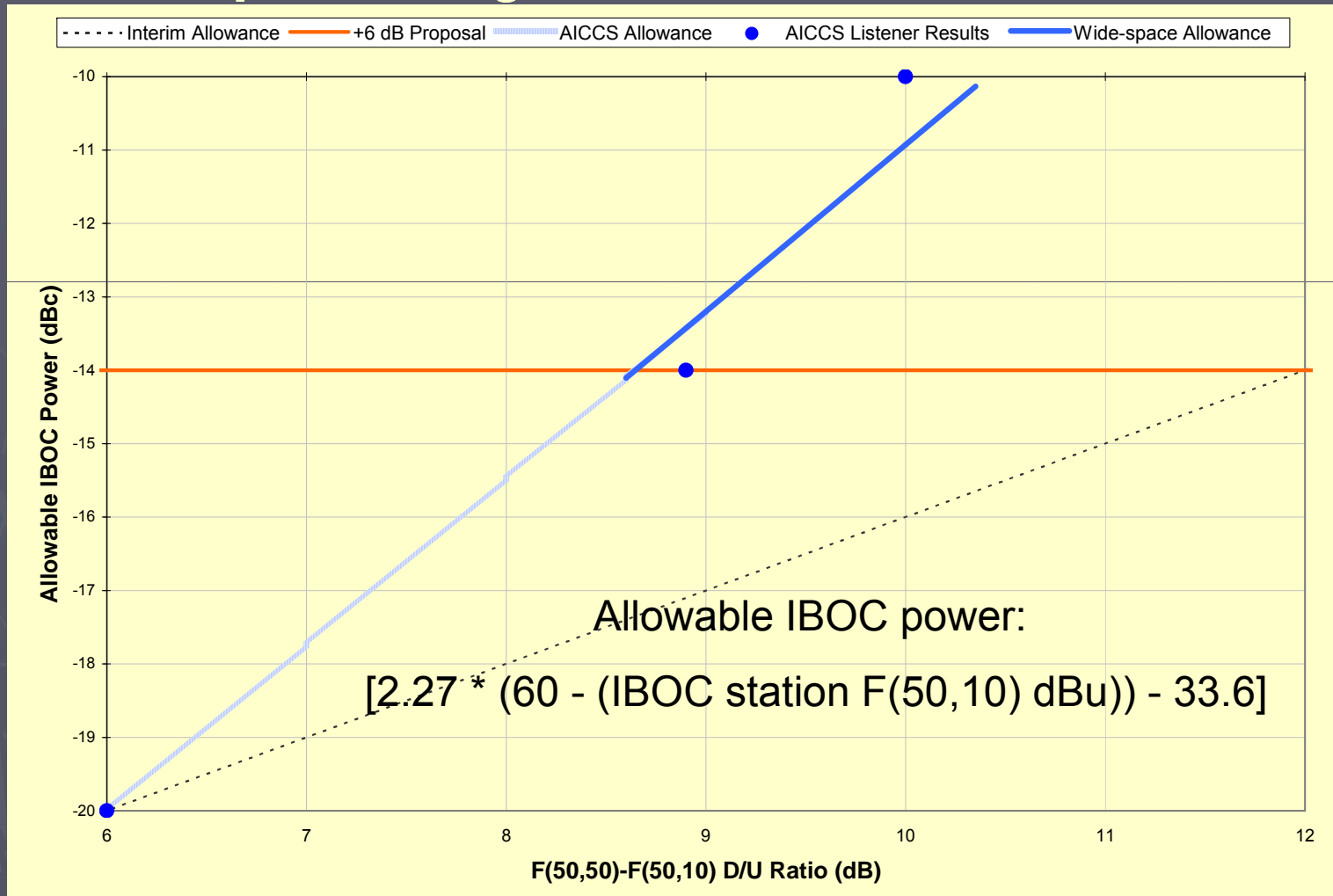
IBOC Power Allowance Calculator

- ▶ Original NPR Labs tool
 - Developed as part of *Advanced IBOC Coverage & Compatibility* (AICCS) study
 - Intended to determine impact of possible IBOC protection scenarios, also promote concept of asymmetrical sideband operation
 - One-time database
 - Pulled after 6 months

IBOC Power Allowance Calculator

- ▶ Restoration of tool, thanks to Nautel
 - Shows the 1st adj. neighbors to protect
 - Shows the 1st adj. neighbors to watch
 - Shows digital sideband powers (individually and in summation)
- ▶ Aids in planning station upgrades
- ▶ *FREE*

AICCS Power Allowance Adopted by FCC's 2010 *Order*



Nautel's Web Site Calculator

The screenshot shows a web browser window displaying the Nautel website's RF Toolkit page. The browser's address bar shows the URL www.nautel.com/support/technical-resources/rf-toolkit/. The website's header includes the Nautel logo, navigation links (Solutions, Support, Why Nautel, We're Listening, News & Events, Contact Us), and a search bar. Below the header is a secondary navigation menu with links for Technical Resources, Contact Support, Training, Policies, Nautel Store, and NUG. The main content area is titled "RF Toolkit" and features several tool links: "Talk to Sales GET A QUOTE", "Sign up for Our Newsletter", "Visit our eStore", and "Send to a Friend". The "NPR HD Radio Calculator" is highlighted with a yellow box. It features a blue and white graphic with the text "HD Radio" and "Pure Digital. Clear Audio." Below the graphic is the text "NPR HD Radio Calculator" and a description: "Calculate a proposed IBOC power increase using our exclusive Asymmetrical IBOC Sideband Elevated Power Calculator from NPR Labs®". The NPR Labs logo is also present, along with the text "Ready to file? NPR Labs can help." To the right of the calculator is the "Radio Coverage Tool" section, which includes a map graphic and the text: "How far is your transmitter going to go? What happens if you change transmitter power, antenna location, or antenna height and gain? Use this handy tool to create colorful maps using different test scenarios." Below the calculator and coverage tool is a login section with links for "Login", "Register", and "Forgot?". The login section is titled "Have an account?" and includes the text "Log in or sign up! It's fast & free!". It features input fields for "Username:" and "Password:", a "Remember me" checkbox, and a "Login" button. Below the login section is a "Privacy" section with the text: "You may think we're getting too personal with our questions, but we're actually using the information you give us to enrich your RF Toolkit experience and make using the tools easier. If you're". The browser's taskbar at the bottom shows several open applications, including "start", "Microsoft PowerPoi...", "RF Toolkit | Nautel ...", "Reports", "WUKY contour stu...", "20091218 AICCS r...", and "Calculator". The system clock shows the time as 7:23 AM.

NPR HD Radio Calculator

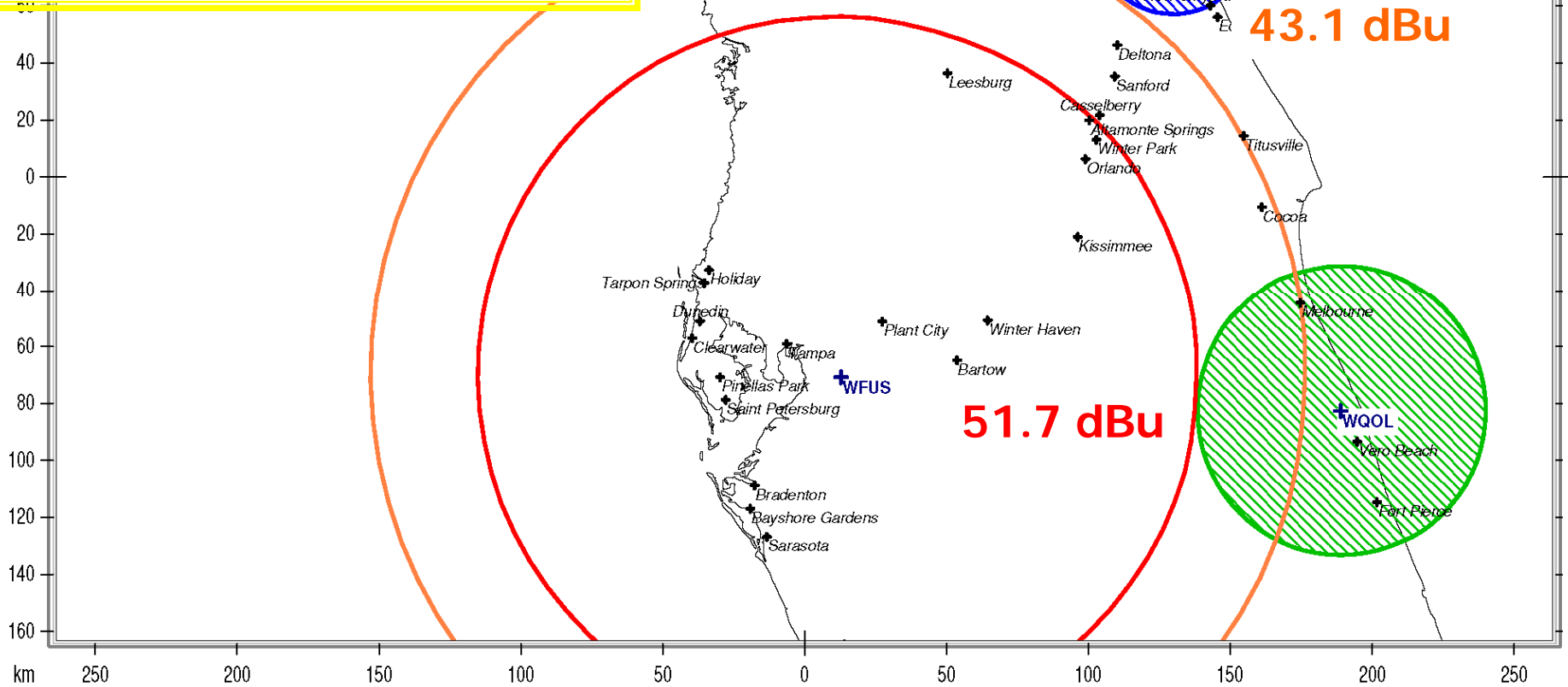
1123 WFUS & 1st adj contours.rs2

Tuesday, December 01, 2009

We recommend you engage the services of a qualified consulting engineer
Use.

Ready to file? NPR Labs can help.

Search call letters:



Sample Result

Search call letters:

search

Powered by



| IBOC Candidate Station | | | | |
|-----------------------------|------------|---------|------------------------|--------------|
| Call Sign | FCC Status | Channel | IBOC Power Limit (dBc) | |
| | | | <i>lower</i> | <i>upper</i> |
| WFUS <i>GULFPORT, FL</i> | LIC | 278C0 | -10.0 | -14.0 |

| Sideband of WFUS | Protected Station | Status | Class | FCC App ID | Bearing to | IBOC WFUS | D/U Ratio | IBOC Power Relative to Protected (dBc) |
|------------------------|---------------------------------------|--------|-------|------------|------------------------------------|---------------------------|--------------|---|
| | | | | | Protected from WFUS (deg. T) | | | |
| L | WVYB <i>HOLLY HILL, FL</i> | CP | A | 1246189 | 37 | F(50,10) (dBu) 43.1 | (dB) 16.9 | -10.0 |
| L | WVYB <i>HOLLY HILL, FL</i> | LIC | A | 998678 | 37 | 42.3 | 17.7 | -10.0 |
| U | WQOL <i>VERO BEACH, FL</i> | LIC | C2 | 148171 | 94 | 51.7 | 8.3 | -14.0 |
| U | WRUF-FM <i>GAINESVILLE, FL</i> | LIC | C1 | 81156 | 356 | 49.0 | 11 | -10.0 |

NPR Labs Web Site (for NCE-FM)

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Asymmetrical IBOC Sideband Elevated Power Calculator

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[Click here for detailed information on the calculation methods.](#)

Ready to file? NPR Labs can help.

| Call Sign | FCC Status | IBOC Candidate Station Channel | IBOC Power Limits (dBc) |
|-----------------------|------------|--------------------------------|-------------------------|
| | | lower | upper |
| WUKY LEXINGTON, KY | LIC | 217C1 | -13 |

| Sideband of WUKY | Protected Station | Status | Class | FCC App ID | Seating to Protected From WUKY (deg. T) | IBOC WUKY F(30,10) (dBc) | D/U Ratio (dB) | IBOC Power Relative to Protected (dBc) |
|------------------|----------------------|--------|-------|------------|---|--------------------------|----------------|--|
| L | WHWO MADISON, IN | CP | A | 1223485 | 315 | 48.5 | 11.5 | -13 |
| L | NEW SMYTHS GROVE, KY | CP | A | 1226282 | 239 | 43.2 | 16.8 | -13 |
| U | WVCT REAVY, KY | LIC | A | 277897 | 170 | 53.4 | 6.6 | -17 |
| U | WLSR SEYMOUR, IN | LIC | B | 1174227 | 399 | 47.1 | 12.9 | -13 |
| U | W8FI MCDANIELS, KY | LIC | A | 541917 | 261 | 41.8 | 16.2 | -13 |

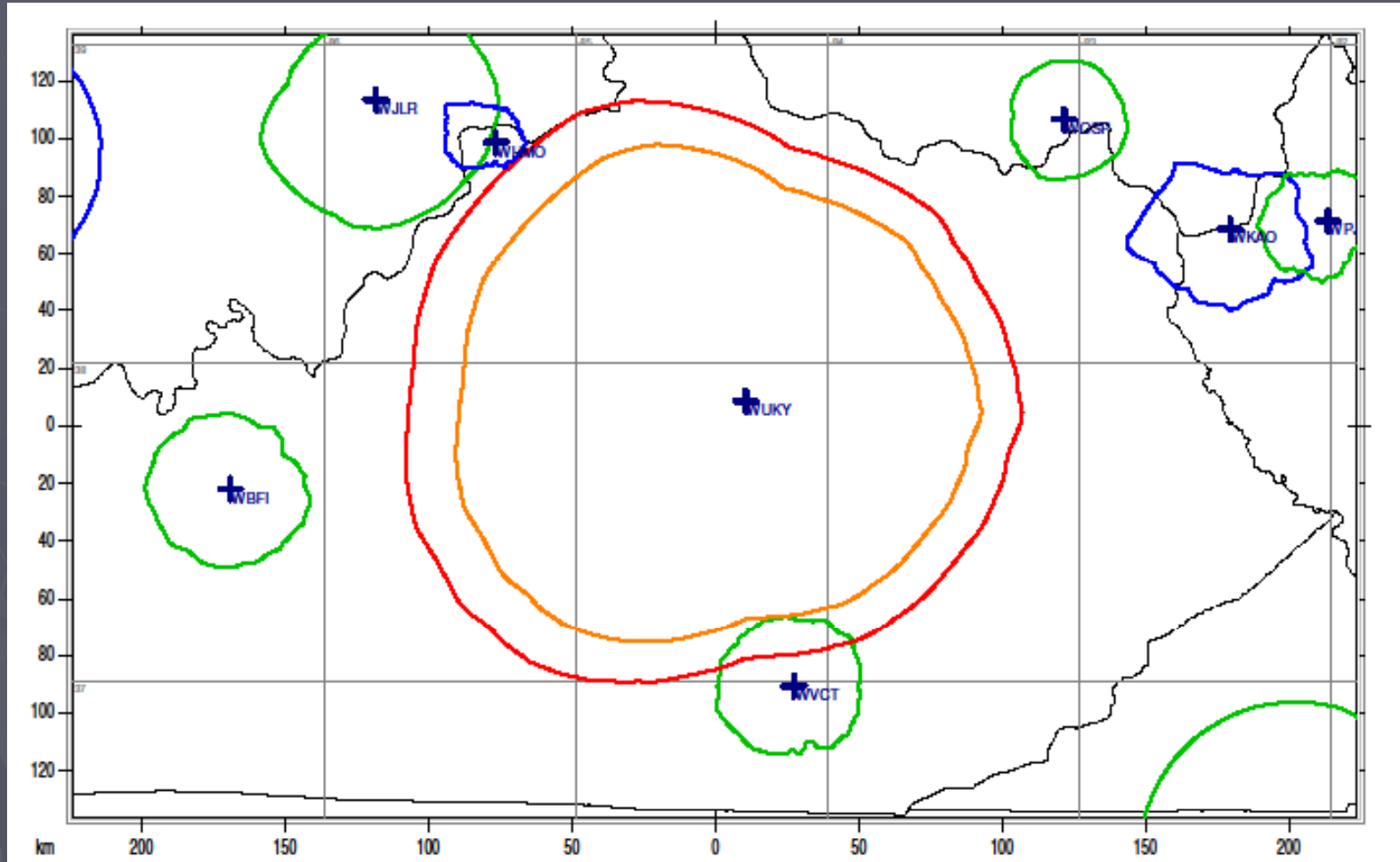
| Call Sign | FCC Status | IBOC Protected Station Channel | IBOC Power Limits (dBc) |
|-----------------------|------------|--------------------------------|-------------------------|
| | | lower | upper |
| WUKY LEXINGTON, KY | LIC | 217C1 | -13 |

| IBOC Candidate Channel | Candidate Station | Status | Class | FCC App ID | Seating to Candidate From WUKY (deg. T) | IBOC Candidate F(30,10) (dBc) | D/U Ratio (dB) | IBOC Power Relative to Protected (dBc) |
|------------------------|----------------------|--------|-------|------------|---|-------------------------------|----------------|--|
| 218 | W8SH HAGERSTOWN, IN | LIC | B1 | 269823 | 182 | 22.8 | 37.2 | -13 |
| 218 | WPHB SLEEFIELD, WV | LIC | C1 | 607260 | 283 | 21.0 | 39 | -13 |
| 218 | WVUS WINCENNES, IN | LIC | B | 813827 | 108 | 24.9 | 35.1 | -13 |
| 218 | W8FI MCDANIELS, KY | LIC | A | 541917 | 81 | 32.5 | 27.5 | -13 |
| 218 | WHCS BRISTOL, TN | LIC | C1 | 181826 | 399 | 24.2 | 35.8 | -13 |
| 218 | WLSR SEYMOUR, IN | LIC | B | 1174227 | 130 | 43.5 | 16.5 | -13 |
| 218 | WOSP POINTSMOUTH, OH | LIC | A | 187023 | 228 | 28.5 | 31.5 | -13 |
| 218 | WVCT REAVY, KY | LIC | A | 277897 | 399 | 48.5 | 11.5 | -13 |

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NCE-FM Station Example: Power Limit Calculation



Sample Result

Asymmetrical IBOC Sideband Elevated Power Calculator

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[Click here for detailed information on the calculation methods.](#)

Ready to file? NPR Labs can help.

| Call Sign | FCC Status | IBOC Candidate Station | | | |
|-------------------------------------|------------|------------------------|------------------------|--------------|-----------------|
| | | Channel | IBOC Power Limit (dBc) | | |
| | | | <i>lower</i> | <i>upper</i> | <i>combined</i> |
| WUKY <i>LEXINGTON, KY</i> | LIC | 217C1 | -13 | -17 | -11.5 |

| Sideband of WUKY | Protected Station | Status | Class | FCC App ID | Bearing to Protected from | IBOC WUKY F(50,10) (dBu) | D/U Ratio (dB) | IBOC Power Relative to Protected (dBc) |
|------------------|---------------------------------------|--------|-------|------------|---------------------------|--------------------------|----------------|--|
| | | | | | WUKY (deg. T) | | | |
| L | WHMO <i>MADISON, IN</i> | CP | A | 1228465 | 315 | 48.5 | 11.5 | -13 |
| L | NEW <i>SMITHS GROVE, KY</i> | CP | A | 1226282 | 239 | 43.2 | 16.8 | -13 |
| U | WVCT <i>KEAVY, KY</i> | LIC | A | 277857 | 170 | 53.4 | 6.6 | -17 |
| U | WJLR <i>SEYMOUR, IN</i> | LIC | B | 1174227 | 309 | 47.1 | 12.9 | -13 |
| U | WBFH <i>MCDANIELS, KY</i> | LIC | A | 541917 | 260 | 41.8 | 18.2 | -13 |

Sample Results

| IBOC Protected Station | | | | | |
|-------------------------------------|------------|---------|------------------------|--------------|-----------------|
| Call Sign | FCC Status | Channel | IBOC Power Limit (dBc) | | |
| | | | <i>lower</i> | <i>upper</i> | <i>combined</i> |
| WUKY <i>LEXINGTON, KY</i> | LIC | 217C1 | -13 | -17 | -11.5 |

| IBOC Candidate Channel | Candidate Station | Status | Class | FCC App ID | Bearing to Candidate from WUKY (deg. T) | IBOC Candidate F(50,10) (dBu) | D/U Ratio (dB) | IBOC Power Relative to Protected (dBc) |
|------------------------|--------------------------------------|--------|-------|------------|---|-------------------------------|----------------|--|
| 216 | WBSH <i>HAGERSTOWN, IN</i> | LIC | B1 | 255823 | 162 | 22.8 | 37.2 | -13 |
| 216 | WPIB <i>BLUEFIELD, WV</i> | LIC | C1 | 607290 | 283 | 21.0 | 39 | -13 |
| 216 | WVUB <i>VINCENNES, IN</i> | LIC | B | 613827 | 108 | 24.9 | 35.1 | -13 |
| 218 | WBFI <i>MCDANIELS, KY</i> | LIC | A | 541917 | 81 | 32.5 | 27.5 | -13 |
| 218 | WHCB <i>BRISTOL, TN</i> | LIC | C1 | 181829 | 309 | 24.2 | 35.8 | -13 |
| 218 | WJLR <i>SEYMOUR, IN</i> | LIC | B | 1174227 | 130 | 43.5 | 16.5 | -13 |
| 218 | WOSP <i>PORTSMOUTH, OH</i> | LIC | A | 187023 | 228 | 28.5 | 31.5 | -13 |
| 218 | WPJW <i>HURRICANE, WV</i> | LIC | A | 1304649 | 252 | 22.2 | 37.8 | -13 |
| 218 | WVCT <i>KEAVY, KY</i> | LIC | A | 277857 | 350 | 48.5 | 11.5 | -13 |