

TECHNICAL EXHIBIT  
CLASS A TV MINOR CHANGE APPLICATION  
FOR CONSTRUCTION PERMIT  
STATION WLFT-CA (FACILITY ID 8653)  
BATON ROUGE, LOUISIANA

AUGUST 26, 2003

CH 30(-) 150 KW-DA

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Technical Narrative

This technical exhibit supports a minor change application to modify Class A television (TV) station WLFT-CA on channel 30 at Baton Rouge, Louisiana (Facility ID 8653). According to the Federal Communications Commission (FCC) database, station WLFT-CA is currently authorized to operate on channel 30 with a minus (-) carrier offset (BPTTA-20030306AAY, BLTTA-20030710ABU pending). A non-directional (ND) antenna system is employed. The visual effective radiated power (ERP) is 50 kilowatts (kW). The antenna center of radiation is 145.1 meters above ground level (AGL), and 152.1 meters above mean sea level (AMSL). The transmitter site coordinates are 30-22-50, 91-03-16 (NAD-27). The FCC antenna registration number for the supporting structure is 1227819.

Proposed Facilities

Station WLFT-CA proposes to modify its operation by changing to a directional antenna (DA) system and increasing the visual ERP. There is no proposed change in channel (30), offset (minus, -), antenna height (145.1 m AGL, 152.1 m AMSL), transmitter site (30-22-50, 91-03-16), supporting structure (1227819), or city of assignment (Baton Rouge, LA). It is proposed to use an ERI model ETU-SM12-30A directional antenna system. The antenna system has an omnioid shaped pattern and the major lobe will be oriented toward 340 degrees True. The proposed maximum visual ERP will be 150 kW.

NTSC Allocation Considerations

A study has been conducted using the pertinent provisions of the FCC rules to assure that the proposal will not create prohibited interference with other authorized or pending analog (NTSC) full service TV, Class A TV, low power TV (LPTV), and land mobile radio service (LMRS) stations. There are no LMRS reservations on pertinent channels in the area for protection from the proposed WLFT-CA operation. The proposed WLFT-CA operation complies with the FCC's normal allocation standards with respect to all known analog assignments, except for assignments shown below.

KADN(TV), Ch.15, Lafayette, LA, BLCT-19890313KI, FID # 33261

WLPB-TV, Ch.27, Baton Rouge, LA, BLET-19910401KE, FID # 38586

KFOL-CA, Ch.30(+), Houma, LA, BLTTA-20010712AAZ, FID # 24978

W52DE, App. for Ch.30(0), New Orleans, LA, BMPTTL-20030523AHM, FID # 57541

WGBC(TV), Ch.30(-), Meridian, MS, BLCT-19910923KF, FID # 24314

WVLA(TV), Ch.33, Baton Rouge, LA, BLCT-19871224KH, FID # 70021

With respect to the above 6 assignments, interference calculations have been made using the procedures outlined in the FCC's OET-69 Bulletin and a 2 kilometers grid. The calculations indicate that the proposed WLFT-CA operation complies with the FCC's 0.5% "de minimis" interference policy. If necessary, a waiver of the FCC rules is requested based on use of the OET-69 procedures and a 2 kilometers grid.

The proposed WLFT-CA Channel 30 facility is located within 32 km of the following analog television facilities:

Call Sign	Location	Channel	Chan. Relationship to WLFT-CA
WLPB-TV	Baton Rouge-LA	27	N+3
WVLA(TV)	Baton Rouge-LA	33	N-3

Station WLPB-TV is located 14.5 kilometers from the WLFT-CA site. Station WVLA(TV) is located 22.2 kilometers from the WLFT-CA site. The FCC's normal separation requirement to these 2 stations is 32 kilometers. A waiver of the FCC Rules is respectfully requested concerning these 2 proposed short-spacings.

The above short-spacings are UHF "taboos" related to the receiver induced third-order intermodulation interference mechanism that can occur in UHF television reception.<sup>1</sup> These interference relationships were studied to determine if there would be any interference caused due to the instant proposal. This is discussed in further detail below.

The intermodulation interference effect is a receiver-induced problem resulting from the combination of strong input channel signals that produce a spurious signal within the tuned channel. The spurious signals,  $f_x$ , can be computed from  $f_x = 2f_a - f_b$  where  $f_a$  is the frequency of one station and  $f_b$  is the frequency of the second station.<sup>2</sup> In the present case, the affected channels are as follows:

Channel Combination	Third-Order Intermodulation Affected Channels
N+3, Channels 30 and 27	23, 24, 25, 32, 33, 34
N-3, Channels 30 and 33	26, 27, 28, 35, 36, 37

The only full service broadcast television stations with Grade B contours falling closer than 35 km of WLFT-CA on these channels are as follows:

Call Sign	Location	Channel	Distance (km)
WLPB-TV	Baton Rouge-LA	27	14.5
WVLA(TV)	Baton Rouge-LA	33	22.2

<sup>1</sup> There is a detailed discussion of the UHF taboos in the *Notice of Inquiry* in MM Docket No. 87-268, Released: August 20, 1987.

<sup>2</sup> See FCC TV *Sixth Report and Order*, Released: April 14, 1952, paragraphs 175-179.

In order to evaluate the interference potential to each of these stations, an analysis of the predicted intermodulation interference was conducted for each of the two channel combination scenarios. The analyses were conducted over a 10,000 point grid cell area within approximately 60-km of the WLFT-CA proposed transmitter site. The analysis was based on the assumption of a 0 dBi gain omni-directional receiving antenna. The procedure of the analysis was as follows:

1. The Longley-Rice predicted desired and undesired field strength for each of the subject stations was calculated at the subject point.
2. The threshold desired-to-undesired (D/U) ratio to interference was determined at each point using data from the appropriate graphs in the 1974 FCC report, *A Study of the Characteristics of Typical Television Receivers Relative to the UHF Taboos*. The Figures #15 and #16 from the 1974 FCC report were employed in the analysis for the N+3 and N-3 analyses, respectively.
3. Using the formulations outlined in the FCC Report, *Report and Recommendations in the Low Power Television Inquiry*, BC Docket No. 78-253, the combined threshold undesired signal level was determined at each grid cell point.<sup>3</sup>
4. The predicted combined undesired signal level was compared to the threshold to determine if interference is predicted at the grid cell point.

The vertical elevation pattern data for WLPB-TV and WVLA(TV) were based on the licensed antenna information contained in the FCC engineering files for these two stations. For elevation angles greater than 11-degrees below the horizon a relative field factor of 0.08 was

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<sup>3</sup> See Technical Appendix B to Part IV dealing with intermodulation interference, pp. 230-242.

employed.<sup>4</sup> For WLFT-CA the actual vertical elevation pattern data was employed taking into account the electrical beam tilt proposed for WLFT-CA.<sup>5</sup>

The following table provides a calculation example for an intermodulation interference analysis with respect to desired station WLPB(27) from the combination of undesired stations WLFT(30) and WVLA(33) at a grid point located approximately 10 km southwest of the WLFT-CA transmitter site:

WLPB-TV Longley-Rice calculated desired signal level	109.1 dBu
WLFT-CA Longley-Rice calculated undesired signal level	103.1 dBu
WVLA(TV) Longley-Rice calculated undesired signal level	108.4 dBu
WLPBTV Calculated level of desired signal assuming 0 dB gain receiving antenna	-22.9 dBm
D/U level from Figure #15 of FCC 1974 Report (mean level)	-17.2 dB
Combined undesired threshold interference level	-17.1 dBm
WLFT-CA Calculated level of undesired signal assuming 0 dB gain receiving antenna	-28.9 dBm
WVLA(TV) Calculated level of undesired signal assuming 0 dB gain receiving antenna	-23.6 dBm
Calculated combined level of undesired signal	-81.4 dBm
Interference calculation result	No interference

Similar results as above would be found for the remaining 9,999 grid points analyzed.

The results of the intermodulation interference analyses with respect to both of the stations under consideration are summarized below:

<sup>4</sup> Angles greater than 11 degrees will affect locations less than 3 km from the transmitter sites.

<sup>5</sup> The proposed maximum peak visual ERP of 150 kW was employed for the main beam maximum effective radiated power.

Station	Interference Analysis Result
WLPB(TV)	Proposal causes no interference.
WVLA(TV)	Proposal causes no interference.

Based on the above it is concluded that the proposal will result in no predicted intermodulation interference population with respect to WLPB(TV) and WVLA(TV) service.

The WLFT-CA site is more than 1400 kilometers from the nearest point of the US/Canada border, and more than 700 kilometers from the closest point of the Mexican border. The WLFT-CA site is 710 kilometers southwest from the FCC's closest monitoring station at Powder Springs, Georgia. The WLFT-CA site is more than 1200 kilometers southwest of the National Radio Quiet Zone in Virginia/West Virginia. It is more than 1600 kilometers southeast of the Table Mountain Radio Quiet Zone in Colorado. The closest radio astronomy site operating on channel 37 is at Fort Davis, Texas, approximately 1234 kilometers west of the WLFT-CA site. These distances are sufficient to not be a coordination concern.

#### DTV Allocation Considerations

Pertinent DTV allotments and assignments on channels 29, 30 and 31 have been examined using the procedures outlined in the FCC's OET-69 Bulletin and a 2 kilometers grid.<sup>6</sup> The proposed WLFT-CA operation complies with the FCC's 0.5% acceptable interference threshold. If necessary, a waiver of the FCC rules is respectfully requested based on use of the procedures outlined in the FCC's OET-69 Bulletin and a 2 kilometers grid with respect to DTV assignments and allotments.

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<sup>6</sup> The duTreil, Lundin & Rackley, Inc. DTV interference analysis program is based on the program and procedures outlined by the FCC in the Sixth Report and Order; subsequent Memorandum Opinion and Order; and FCC OET Bulletin No. 69. A nominal grid size resolution of 2 km was employed. A Sun based processor computer system was employed. The results have been found to be in very close agreement with the results of the FCC implementation of OET Bulletin No. 69.

Radiofrequency Electromagnetic Field Exposure

The proposed WLFT-CA facilities were evaluated in terms of potential radio frequency (RF) energy exposure at ground level to workers and the general public. A visual ERP of 150 kW with 10% aural power was assumed. A conservative relative field value of 0.25 (-12 dB) was assumed for the antenna's downward radiation (see Figure 2). The proposed antenna center of radiation is located 145.1 meters above ground level. The calculated power density at a point 2 meters (6.6 feet) above ground level is 0.0076 mW/cm<sup>2</sup>. This is about 2% of the FCC's recommended limit of 0.38 mW/cm<sup>2</sup> for channel 30 for an "uncontrolled" environment. It is less than 1% of the FCC's recommended limit for a "controlled" environment.

Access to the transmitting site will be restricted and appropriately marked with warning signs. In the event that workers or other authorized personnel enter restricted areas or climb the tower, appropriate measures will be taken to assure worker safety with respect to radio frequency radiation exposure. Such measures include reducing the average exposure by spreading out the work over a longer period of time, wearing "accepted" RFR protective clothing and/or RFR exposure monitors or scheduling work when the stations are at reduced power or shut down.

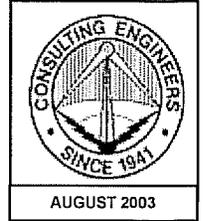
If there are questions concerning this technical exhibit, please communicate with the office of the undersigned.

John A. Lundin

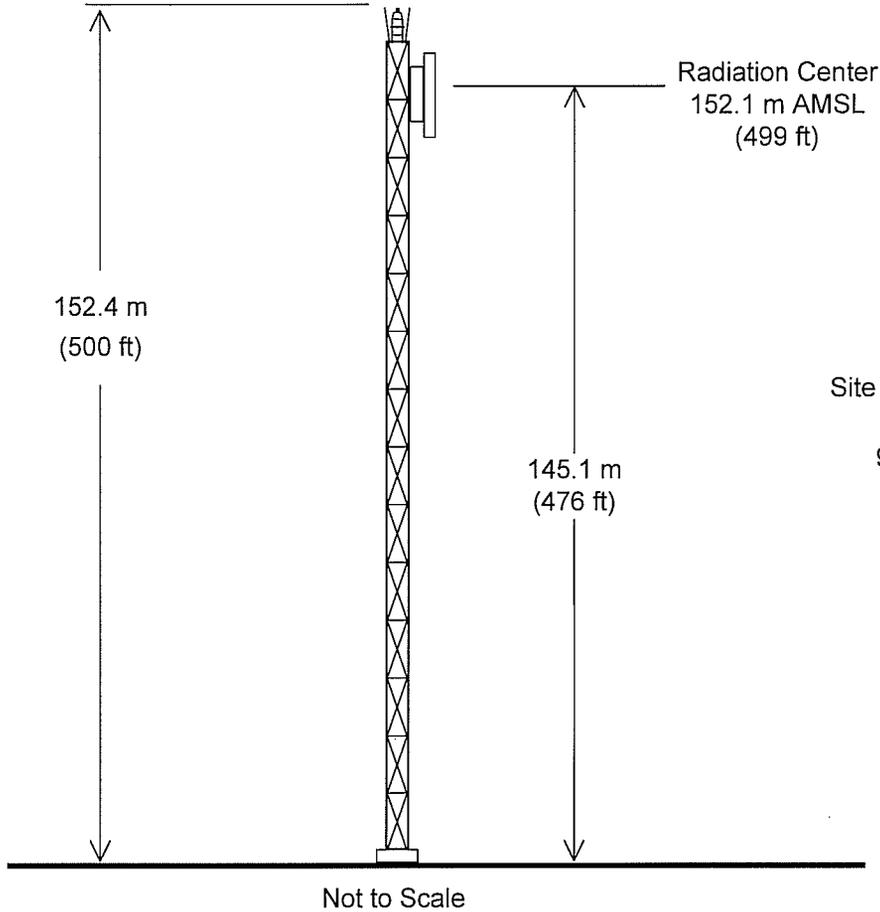
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August 26, 2003

FCC Tower ID: 1227819



159.4 m AMSL  
(523 ft)



Site Coordinates:  
30°22'50"N  
91°03'16"W  
(NAD-27)

## ANTENNA AND SUPPORTING STRUCTURE

STATION WLFT-CA  
BATON ROUGE, LOUISIANA  
CH 30(-) 150 KW-DA

du Treil, Lundin & Rackley, Inc. Sarasota, Florida

ERI Job # 09806, WLFT-TV Baton Rouge, LA

ETU-SM12-30A

**Antenna Model: ETU-SM12-30A**

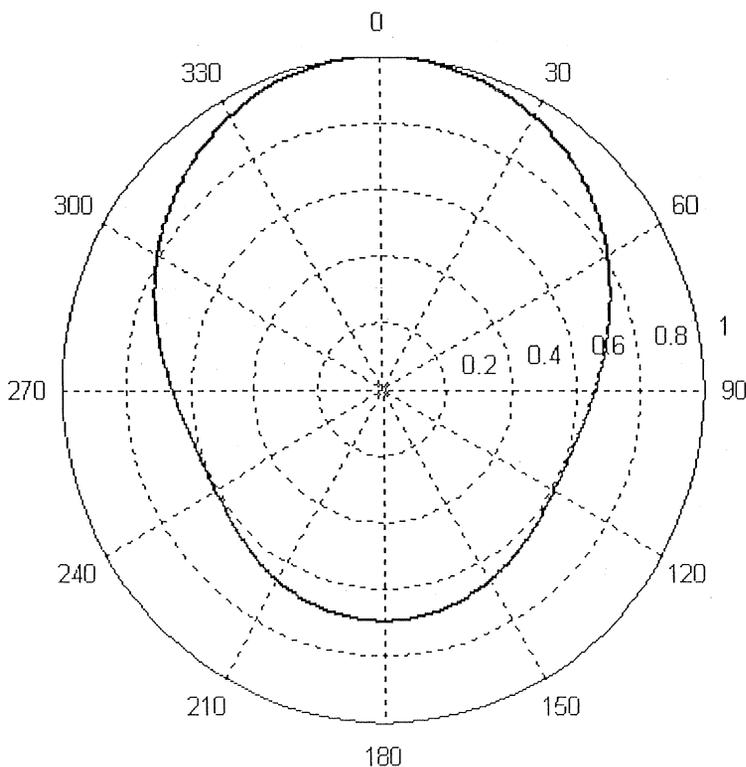
Input Connector: 3-1/8" EIA  
Input Power Rating: 5-kW peak of sync + 10% aural (as installed)  
7-kW\* peak of sync + 10% aural (optional)  
Azimuth Directivity: 1.7 (2.3 dB)  
Elevation Directivity: 12.89 (11.10 dBd)  
Total Directivity: 21.92 (13.41 dBd)

Beam tilt: -1.45 degrees

\*On-site modifications to the installed antenna system required. Will not impact patterns or directivity.

**Azimuth Pattern**

Azimuth Directivity: 1.7 (2.3 dB)



ERI Job # 09806, WLFT-TV Baton Rouge, LA

ETU-SM12-30A

### Elevation Pattern

Elevation directivity: 12.89 (11.10 dBd)

Beam tilt: -1.45 degrees

