

TECHNICAL EXHIBIT  
MINOR MODIFICATION OF LICENSE  
SPANISH BROADCASTING SYSTEM HOLDING COMPANY, INC.  
FM TRANSLATOR STATION W276AI  
PONCE, PUERTO RICO  
CHANNEL 276D  
FACILITY ID 53553

JULY 26, 2017

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Table of Contents

Technical Statement

Figure 1	Fill-In Compliance Map
Figure 2	Allocation and Overlap Contours of Existing and Proposed Facilities
Appendix 1	Notification and Letter of Consent Arecibo Astronomical Observatory
Appendix 2	HAAT Calculation – FCC Online Tool
Appendix 3	Proposed Antenna Vertical Plane Radiation Pattern

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Technical Narrative

The technical exhibit, of which this narrative is part, has been prepared on behalf of Spanish Broadcasting System Holding Company, Inc., licensee of a FM translator W276AI, in Ponce, PR, Fac. ID 53553. W276AI is a fill-in translator of FM station WNOD, Fac. ID 53554. The licensee is requesting a minor license modification of W276AI to move to a nearby site, as explained below; no change in channel is proposed.

Licensed and Proposed Transmitter Locations

W276AI needs to relocate to a different location due to site contractual difficulties. The proposed site, an existing registered tower housing FM station WZMT, is located 1.37 kilometers SW from the licensed W276AI site. The proposed transmitting facility would operate on its existing channel 276 using a new Scala CL-FM vertical polarized antenna, side-mounted on an existing tower with ASR 1011495. The proposed site is described by the following NAD27 geographic coordinates:

17° 59' 27.1" North

66° 37' 45.4" West

The NAD 83 site coordinates are: 17-59-20.0 N / 66-37-44.0 W. It is proposed to side mount the existing antenna at a height of 51 meters (168 feet) above ground on the existing tower at a site with an elevation of 2.4 meters AMSL. Thus, the antenna will be mounted with a RC height of 53.4 m AMSL. According to the FCC HAAT web utility, this corresponds to a HAAT of -30 meters (Appendix 2). An ERP of 100 Watts is proposed for this facility.

Tower Registration

The FAA is not being notified of the proposed construction, as it is proposed to side-mount the FM antenna on an existing 53 meter registered tower, ASRN 1011530.

### Environmental Considerations

The proposal is excluded from environmental processing, as an existing supporting structure is to be employed and the proposal complies with the FCC Rules concerning human exposure to radio frequency (RF) energy. The proposal would not exceed 0.3 % of the RF exposure limit for general population/uncontrolled environments for the frequency proposed. The calculation of RF energy at 2-m above ground was made under the procedures of OET Bulletin No. 65.\* The formula employed is as follows:

$$S = \frac{(33.4)F^2P}{R^2}$$

where,  $S$  = power density in  $\mu\text{W}/\text{cm}^2$ ,  $F$  = relative field factor at the angle to the calculation point,  $P$  = the total effective radiated power relative to a dipole in watts, and  $R$  = distance from the antenna radiation center to the calculation point in meters.

Based on the vertical radiation pattern of the proposed antenna, a relative field factor of 0.65 or less for any depression angle equal or greater than 30 degrees below horizon (see Appendix 3), a total effective radiated power of 100 watts (vertical polarization) and an antenna radiation center height above ground of 51 m, the calculated power density will not exceed  $0.6 \mu\text{W}/\text{cm}^2$ . Therefore, the calculated RF exposure at 2 m above ground will not exceed 0.3 % of the limit of  $200 \mu\text{W}/\text{cm}^2$  for the general population and uncontrolled environments.

The antenna system will be restricted from access and appropriate warning signs posted. As this is a shared site, in the event that personnel are required to climb the structure, the FM transmissions of W276AI will be reduced or terminated as necessary to prevent RF exposure above the FCC recommended limits.

### FCC Monitoring Stations

FCC rules pertaining to FCC monitoring stations, Section 73.1030(c), requires that the proposed facility does not produce a field strength greater than 10 mV/m at the FCC stations. The closest FCC monitoring station to the proposed operation is located at Santa Isabel, PR, at a distance of 27 kilometers along an azimuth of  $86^\circ$  N. The proposed operation will produce field strengths much lower than 10 mV/m at the FCC station in Santa Isabel, PR.

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\* Federal Communications Commission OET Bulletin No. 65, Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields (Edition 97-01, August 1997).

### Quiet Zone Notification

As required by FCC rules pertaining to radio Quiet Zones, Section 73.1030(a), the National Astronomy and Ionosphere Center (NAIC) in Arecibo, Puerto Rico is being notified of this application. A copy of the notification letter and of the letter of consent from the Arecibo Observatory of the proposed facility are included in Appendix 1.

### AM Stations within 3.2 kilometers

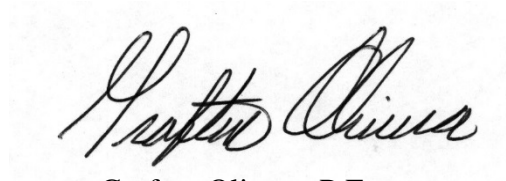
There are several non-directional AM stations within 3.2 km of the above specified coordinates. But since an existing tower, for which no significant structural changes are contemplated is proposed, no adverse effect should be caused to any AM station and the proposal is believed to be compliant with Section 47 CFR 73.1692.

### Fill-In Compliance and Allocation Considerations

Figure 1 is a Fill-In Compliance map. As shown in Figure 1, the proposed translator 54 dBu contour will be contained within the 54 dBu contour of WNOD(FM). Figures 2a, 2b, 2c, and 2d summarize the allocation study and contour overlap of the licensed and proposed facilities of W276AI with respect to FM stations WDIN(FM), WVJP-FM, and WTOK-FM. As indicated in these figures, in all three cases, the existing overlaps between W276AI and these stations will be reduced.

The predicted contours were calculated in accordance with Section 73.313 of the FCC Rules, using the V-Soft FMCommander@2016 software in conjunction with the 30 second Global terrain database; contour calculation were made using an evenly spaced set of radials. The antenna height elevations of the facilities was used in conjunction with the propagation prediction curves of Section 73.333 to determine distances to contours.

For the reasons stated above, it is believed that the proposed facility is in compliance with FCC Rules and Regulations and will serve the public interest.

A handwritten signature in black ink, reading "Grafton Olivera", is centered on the page. The signature is fluid and cursive, with the first name "Grafton" and last name "Olivera" clearly distinguishable.

Grafton Olivera, P.E.

Consulting Engineer

5119 60<sup>th</sup> Drive E

Bradenton, Florida 34203

(941) 329-6001

July 26, 2017

Figure 1



PROPOSED FACILITY FILL-IN COMPLIANCE MAP  
FM TRANSLATOR W276AI  
PONCE, PUERTO RICO  
CH 276D (103.1 MHZ) 0.10 KW DA

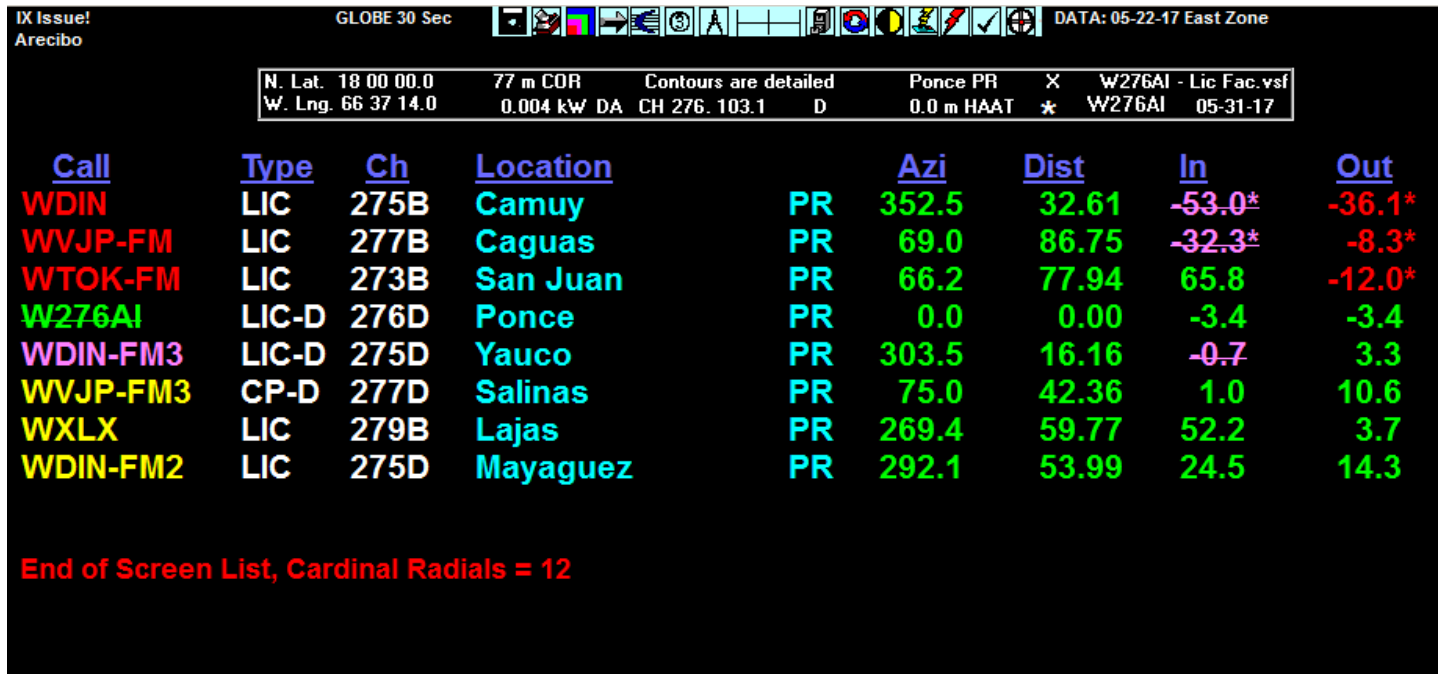




Figure 2a

# Allocation Study - W276AI

Licensed:



Proposed:

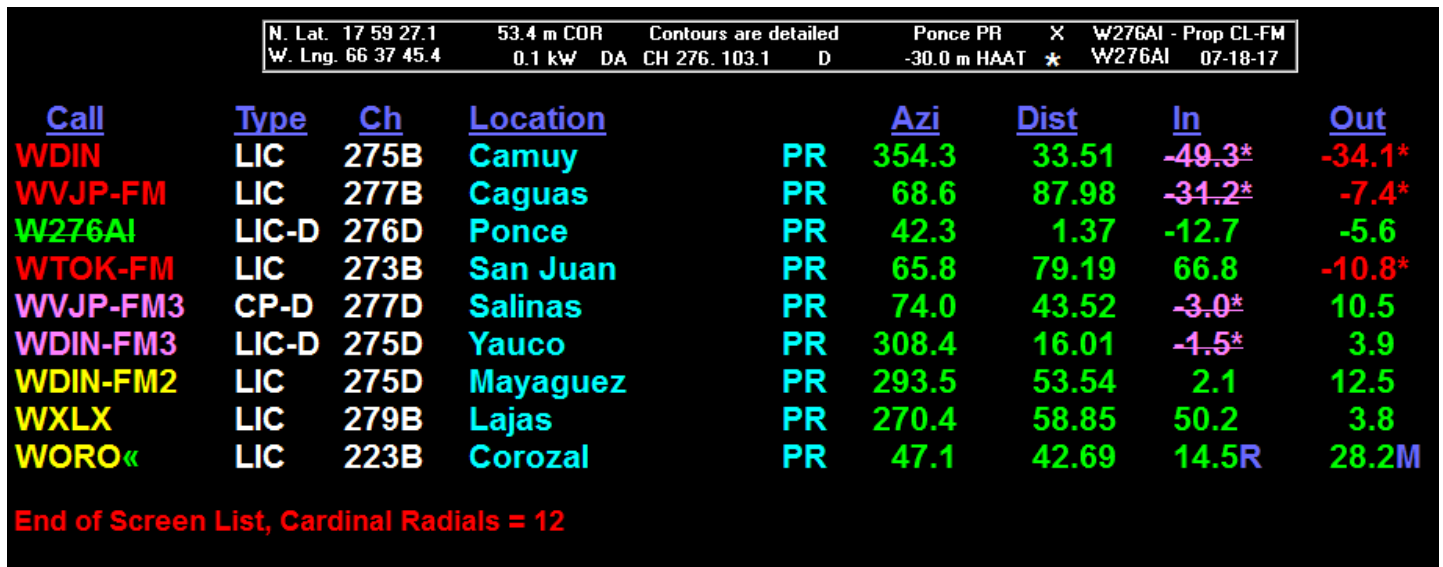
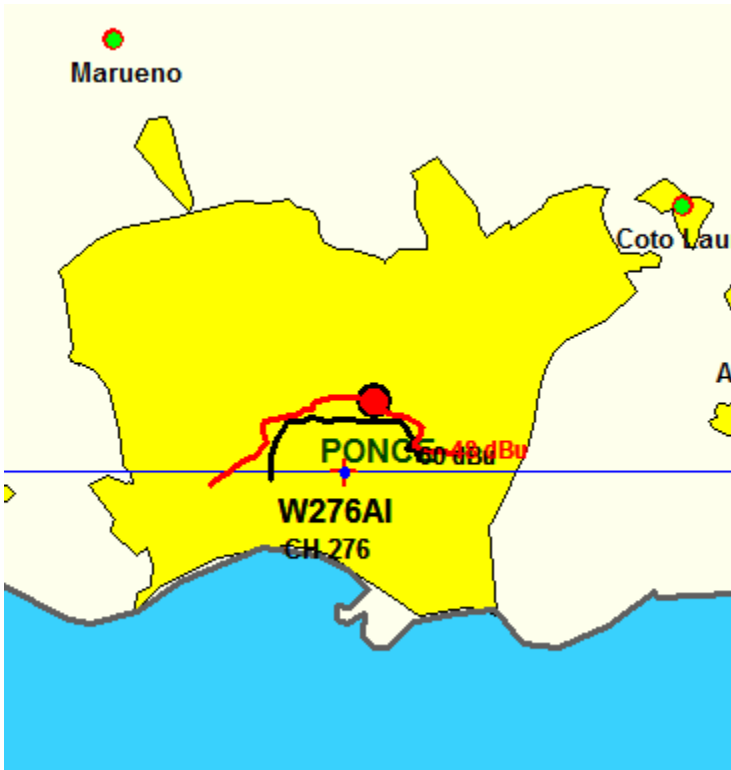


Figure 2b

Contour Overlaps with WDIN(FM)

Licensed:



Proposed:

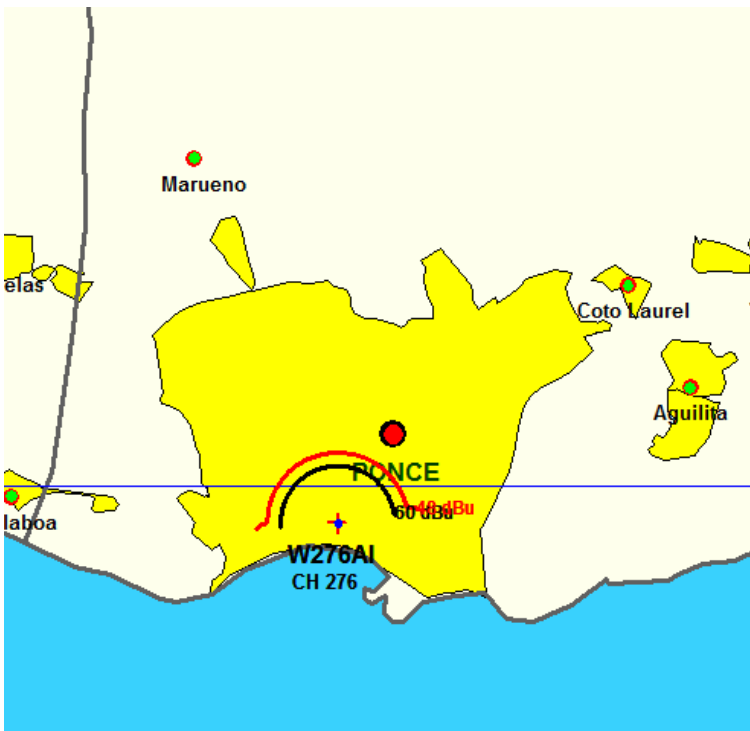


Figure 2c

Contour Overlaps with WVJP-FM

Licensed:



Proposed:



Figure 2d

Contour Overlaps with WTOK-FM

Licensed:



Proposed:



## *Appendix 1*

**Grafton Olivera, P.E.**

Consulting Engineer

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July 18, 2017

Via email (prcz@naic.edu)

Angel M. Vázquez, Spectrum Manager  
National Astronomy and Ionosphere Center  
Arecibo Observatory  
HC3 Box 53995  
Arecibo, PR 00612

Gentlemen:

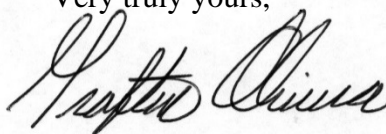
On behalf of our client, Spanish Broadcasting System Holding Company, Inc., licensee of a FM translator W276AI, in Ponce, PR, Fac. ID 53553, in accordance with Section 73.1030 of FCC Rules, we hereby notify of a proposed minor modification of license for W276AI. The particulars of the proposal are as follows:

Proposed Facility:

Geographical coordinates of antenna location (NAD27): 17-59-27.1 / 66-37-45.4  
Antenna height: 51 m AGL; 53.4 m AMSL  
Maximum Antenna Gain (horizontal plane): 7.0 dBd  
Operating channel: 276 (103.1 MHz)  
Type of emission: F3E  
Effective isotropic radiated power: 0.164 kW – Vertical Polarization

Please review this proposal and let me know your findings; feel free to communicate via email (<mailto:Grafton.Olivera@me.com>), telephone (941-323-0381) or regular mail.

Very truly yours,



Grafton Olivera, P.E.  
5119 60th Drive E  
Bradenton, FL 34203

Tel. 941-323-0381  
Email: [Grafton.Olivera@me.com](mailto:Grafton.Olivera@me.com)

# ARECIBO OBSERVATORY

The William E. Gordon Telescope  
Angel Ramos Foundation Science and Visitor Center



July 26, 2017

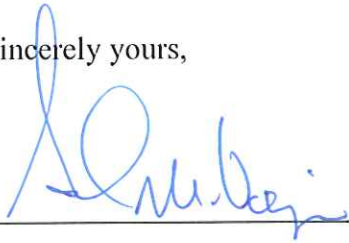
Mr. Grafton Olivera, P.E.  
Consulting Engineer  
5119 60<sup>th</sup> Drive E  
Bradenton, FL 34203

Re: Spanish Broadcasting System Holding Company, Inc.  
Call Sign W276AI - Fac. ID 53553

Dear Grafton Olivera:

Thank you very much for the copy of your FCC application sent to us in accordance with the Puerto Rico Coordination zone agreements. We have considered the technical aspects of your application and find that your installation/path originating is unlikely to cause harmful interference to the passive use of the Radio Astronomy bands at the Observatory. We therefore have no objection to your proposed installation.

Sincerely yours,



Angel M. Vázquez  
Spectrum Manager

AV:ws

Cc: PRCZ files [File #00170070016]

## APPENDIX 2

### Antenna Height Above Average Terrain Calculations -- Results

#### Input Data

Latitude    **17° 59' 20"** North  
Longitude   **66° 37' 44"** West    (NAD 83)

Height of antenna radiation center above mean sea level: **53.4** meters AMSL

Number of Evenly Spaced Radials = **12**      0° is referenced to True North

#### Results

Calculated HAAT = **-30 meters**

Antenna Height Above Average Terrain calculated  
using 1 km GLOBE terrain data

#### Individual "Radial HAAT" Values, in meters

0°	-270.5 m
30°	-124.8 m
60°	-1.4 m
90°	48.6 m
120°	52.9 m
150°	53.4 m
180°	53.4 m
210°	53.4 m
240°	52.4 m
270°	8.9 m
300°	-96.1 m
330°	-191.3 m

Print Results?

New Calculation?

APPENDIX 3

