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January 13, 2015

Øyvind Christensen
avdelingsdirektør
Ministry of Culture
Sent via email: postmottak@kud.dep.no

Re: Digitisation of local radio in Norway

Dear Mr. Christensen:

On behalf of iBiquity Digital Corporation (“iBiquity”), I am writing in response to the Ministry’s recent request for comment concerning radio services. In these comments, iBiquity recommends that the government approve the use of HD Radio technology™ as a complement to DAB service to provide local broadcasters a means to upgrade to digital. Although this proceeding addresses a number of issues concerning the commercial radio sector, iBiquity restricts these comments to the benefits and feasibility of introducing HD Radio™ technology in Norway. iBiquity explains in greater detail below the benefits of HD Radio technology for the Norwegian market and provides some views on the best means of introducing HD Radio broadcasting in Norway. iBiquity does not suggest that the HD Radio system be viewed as a substitute for DAB or DAB+. Instead, iBiquity encourages the Ministry to consider HD Radio technology as a cost effective and efficient means for upgrading local stations that will not benefit from the DAB transition.

Overview of HD Radio Technology.

The HD Radio system is designed to enable a transition from analog to digital broadcasting without the need for new spectrum allocations, disruptions in radio service or changes in consumer behavior. The system uses two modes: the “hybrid” mode and the “all digital” mode. In the hybrid mode, the system inserts digital carriers on both sides of a station’s existing analog signal without causing interference to the host station’s analog signal or the analog signal of co- or adjacent channel stations. The hybrid mode allows broadcasters to simulcast existing analog programming in a digital format to provide a transition period for stations and consumers to adopt digital broadcasting. In the all digital mode, the analog signal is turned off and additional digital capacity and features can be introduced. The system ensures that consumers with analog receivers will continue to receive a station’s programming during the transition period, but it also allows consumers who purchase a digital receiver to enjoy immediately the benefits of the digital system.

The station conversion process is not complicated. Most modern transmitters are compatible with HD Radio broadcasting. A station needs a digital exciter and a combiner that

combines the analog and digital signals. Stations that want to take advantage of the multicasting and datacasting features of the system also need an “importer” to format and manage that information. Broadcasters can continue to use the remainder of their studio and transmission facilities, thereby reducing the overall cost of station conversions. Several manufacturers offer a range of HD Radio equipment and implement station conversions on a routine basis.

HD Radio broadcasting provides many benefits that can help radio remain competitive with other distribution platforms. Digital broadcasts provide listeners with enhanced audio quality. Digital broadcasts offer CD-quality sound.¹ The digital system eliminates the hiss, clicks and pops frequently associated with analog broadcasts. Advanced coding techniques virtually eliminate multicast interference, which can be particularly important in dense urban areas. The system also supports new audio and data services that cannot be offered using an analog broadcasting platform.

The system’s multicasting feature allows digital broadcasters to introduce up to three new digital-only programs on the same frequency that are unrelated to a station’s analog broadcast. These multicast channels are broadcast along with the digital simulcast of the station’s existing analog programming.

All HD Radio broadcasters have the ability to offer “Program Information” such as the artist name, song title and station information. The system is able to transmit this information for all digital channels, including multicast channels.

“Artist Experience” allows broadcasters to transmit static visual images that are displayed on the screen of the receiver. These images can include the album art associated with the song being broadcast, related images of the band or artist, station logos and commercial images.

The HD Radio system also allows broadcasters to offer new data services unrelated to the audio broadcast. Some stations use Journaline to broadcast news, sports, weather, and other information that can be accessed by touching a button on the screen of the radio. The HD Radio system can be used to broadcast traffic updates and new map information for car navigation systems faster than analog radio and without incurring any charges for use of cellular networks. The point-to-multipoint architecture of radio makes it particularly suited to these types of data services.

All of these new features are available without new spectrum, disruptions to station operations or the need to change consumer behavior. The system’s ability to introduce digital broadcasting without causing harmful interference to existing analog operations allows regulators to authorize all stations to upgrade to digital without the need for new licenses. The digital signal is introduced on the same channel as the existing analog signal. As a result, consumers continue to find their favorite stations at their existing dial positions. The hybrid mode offers a rational transition to an all digital world that allows broadcasters and consumers to upgrade to digital equipment during normal upgrade cycles.

¹ *NRSC-R206, Evaluation of iBiquity AM and FM IBOC “Gen 3” hardware* (June 30, 2004) at 3, available at <http://nrcstandards.org/Reports/NRSC-R206.pdf>.

Status of Rollout of HD Radio Technology in the U.S.

The U. S. Federal Communications Commission (“FCC”) authorized U.S. broadcasters to commence HD Radio broadcasts in 2002.² Since that time, more than 2,200 stations have adopted HD Radio technology throughout the United States. Stations in the United States support Artist Experience on over 1,000 digital channels, and U.S. broadcasters have introduced more than 1,500 multicast channels. The multicasting feature has resulted in a surge of creativity among broadcasters seeking to reach listeners with new formats.

The conversion of stations to HD Radio broadcasts has been accompanied by the introduction of HD Radio receivers for every major receiver segment. As of December 31, 2014, approximately 25 million HD Radio receivers were in the commercial market. HD Radio technology is available as original equipment and aftermarket automobile receivers as well as in home AVR, tabletop and portable receivers. All major automobile manufacturers serving the U.S. market offer HD Radio receivers in their vehicles as standard equipment and for free to the consumer.³ HD Radio receivers can be purchased online and at thousands of traditional retailers.⁴ More than forty percent of all new passenger vehicles sold in the U.S. in 2014 included HD Radio receivers.

Two separate networks of stations in the United States broadcast traffic updates and navigation information for car receivers. Honda, Lexus, Mitsubishi, Mazda and Toyota all offer vehicles with these enhanced digital broadcast telematics services subscription-free for the life of the vehicle. Garmin also uses these HD Radio Digital Traffic Services for portable navigation devices.

HD Radio Rollout in Mexico

Mexico authorized the introduction of HD Radio technology in 2011.⁵ 36 Mexican stations have begun broadcasting digitally, including 13 stations in Mexico City. These stations reach some 33 million people nationwide – more than 25% of the Mexican population. As has been the case in the United States, Mexican broadcasters are experimenting with the new services the HD Radio system can support. There are over 25 new multicasting channels in operation delivering subscription-free digital music and infotainment channels to the Mexican public.

² *Digital Audio Broadcasting Systems and Their Impact on the Terrestrial Broadcast Service*, 17 FCC Rcd 19990 (2002)(“Report and Order”).

³ See <http://hdradio.com/get-a-radio/new-car> for a comprehensive list of each brand and every vehicle model offering HD Radio receivers.

⁴ See <http://hdradio.com/get-a-radio/retailers> for a list of HD Radio retailers.

⁵ ACUERDO POR EL QUE SE ADOPTA EL ESTÁNDAR PARA LA RADIO DIGITAL TERRESTRE Y SE ESTABLECE LA POLÍTICA PARA QUE LOS CONCESIONARIOS Y PERMISIONARIOS DE RADIODIFUSIÓN EN LAS BANDAS 535-1705 KHZ Y 88-108 MHZ, LLEVEN A CABO LA TRANSICIÓN A LA TECNOLOGÍA DIGITAL EN FORMA VOLUNTARIA, Comisión Federal de Telecomunicaciones (May 18, 2011), available at <http://sictet.cft.gob.mx/publicdata/P-180511-142.pdf>.

Other Developments

HD Radio technology has been adopted as the digital radio standard in Panama⁶ and the Philippines.⁷ Several stations have converted to digital broadcasting, and iBiquity is working with the consumer electronics industry to introduce digital receivers for those markets. The HD Radio system is in use in Romania and Canada on an ongoing basis and has been tested in Switzerland and France as well as South America and Asia.

Implementation

HD Radio technology allows broadcasters to introduce the digital signal without causing harmful interference to the host station's analog signal or the analog signals of co- and adjacent channel stations. The digital signal uses advanced coding techniques and very low power levels for the digital carriers to avoid interference to analog signals but at the same time to allow for robust digital coverage. Rigorous testing conducted in the United States⁸ and real world experience gained through the use of HD Radio technology by more than two thousand stations in the United States and Mexico during the past decade have confirmed the viability of introducing HD Radio broadcasts without harmful host or adjacent channel interference.

In addition to minimizing harmful interference, the HD Radio system will not have other technical impacts on incumbent stations. The technology is compatible with most stations' transmission and studio equipment as well as studio-to-transmitter links. In some cases, stations can upgrade to digital with the simple introduction of a digital exciter. In other cases, it is necessary to introduce more up-to-date transmitters and combiners. However, these upgrades are routinely implemented without impact to station operations.

All of these benefits can be achieved quickly and easily by Norwegian broadcasters and listeners. Tests iBiquity has conducted in Europe confirm the HD Radio system will work in a 100 kHz spacing environment. The market for HD Radio transmission and receiver equipment is mature. This means Norwegian broadcasters and listeners will avoid the high costs normally associated with new technologies. The equipment costs for digital exciters includes all fees associated with the technology – Norwegian broadcasters will not need to pay a separate license fee to iBiquity. Moreover, Norwegian broadcasters and consumers will benefit from the existing economies of scale associated with the broad-based rollout of HD Radio technology in the

⁶ Decreto Ejecutivo No. 96, Gaceta Oficial Digital, No. 26279, República de Panamá (May 12, 2009), available at <http://www.gacetaoficial.gob.pa/pdfTemp/26279/17612.pdf>.

⁷ *Guidelines for the Operation of Digital FM Radio Broadcast*, Memorandum Circular No. 11-11-2007, Republic of the Philippines Department of Transportation and Communications, National Telecommunications Commission (Nov. 26, 2007), available at <http://www.ntc.gov.ph/laws/mc/MC%202007/MC%2011-11-2007%20GUIDELINES%20FOR%20THE%20OPERATION%20OF%20DIGITAL%20FM.pdf>.

⁸ *NRSC-R203, Evaluation of the iBiquity Digital Corporation IBOC System – Part 1 – FM IBOC* (Nov. 1, 2001).

United States and Mexico. Although costs vary depending on the needs of each station, conversion costs could be as low as 21.500 Euro for a station. Due to the existence of multiple vendors and a robust marketplace, HD Radio transmission equipment is available for introduction in Norway at any time.

iBiquity, Nautel Limited and Radio Nero recently collaborated on tests of the HD Radio system in Norway that confirmed the viability of using HD Radio technology for local radio stations. An over-the-air test was conducted at 98.7 MHz from Brannfjell in Oslo and included three digital audio channels. A test vehicle was driven through Oslo and the surrounding area. The station's engineers concluded the digital coverage exceeded the typical analog coverage for the facility.

The HD Radio system also will work cooperatively with the DAB+ system due to multi-standard receiver chipsets. Car manufacturers are utilizing multi-standard chips to address country specific digital radio standards. iBiquity is actively working with semiconductor and receiver manufacturers to maximize efficiencies for multi-standard chips that support both DAB and HD Radio functionality. To maximize the benefits of HD Radio technology, all Norwegian stations should have the option to upgrade to digital. HD Radio technology has benefits that will be attractive to all stations. Enhanced audio quality, Program Information, the Artist Experience feature and new information services such as news updates and traffic information are all services that could be used by any station. Multicasting can be used to introduce new formats and programming.

The government should adopt a flexible licensing framework that promotes widespread adoption of digital radio and that encourages broadcasters to implement creative uses of the technology. iBiquity encourages the government to craft its regulatory framework taking into account the following principles.

First, the regulatory framework should allow all stations to convert to digital operations without the need for individual digital licenses. In the United States the FCC required that stations simply file a written notification of commencement of digital operations. This approach has allowed the FCC to track station conversions without imposing burdensome regulatory requirements on either station licensees or the regulatory staff.

Second, the regulatory framework should be based on the premise that stations will be authorized immediately to implement the full suite of technical features and functionality that have been phased in over a period of years in the United States. For example, the FCC originally authorized stations to operate with their digital signal at -20 dBc. That was later increased to -14 dBc with some stations now authorized to operate at -10 dBc. Norwegian stations should be encouraged to take advantage of the full potential of the digital system by operating at -10 dBc. In the unlikely event that there is interference to an adjacent channel analog signal, the digital station can reduce its power or use asymmetric sidebands to reduce digital power on one side. The government should avoid duplicating the experience in the United States where an overly cautious approach resulted in unnecessarily low digital power levels that limited digital coverage.

Third, the regulatory framework should authorize a range of services that will maintain and reinvigorate consumer interest in broadcast radio. Although multicasting and datacasting services are optional, the government should craft the regulatory framework to allow all digital stations to offer these services without the need for separate licenses. As part of this authorization, the government should provide broadcasters with the flexibility to decide the best way to allocate capacity among the various audio and data services they offer. Also, the regulatory framework should allow broadcasters to lease capacity for multicasting and datacasting in order to provide additional revenue to offset the costs of the digital transition and to increase diversity of viewpoint.

Fourth, the government should not impose stricter regulatory requirements on digital stations than currently exist for analog broadcasting. It is reasonable and appropriate for digital stations to be required to abide by the same technical, policy and content requirements that are imposed on analog broadcasts. However, additional regulatory burdens that restrict the benefits broadcasters will derive from digital will create a disincentive for stations to make the investment in a digital conversion.

Finally, the government should establish at the outset an expectation that over time all stations will convert to digital. There is no need to set a time frame for full digital conversion at this point, however, articulating a policy that there is an expectation that stations will convert over time will provide an additional incentive for stations to quickly adopt the technology. This will help encourage more widespread introduction of digital receivers in Norway and provide greater regulatory certainty for broadcasters and consumers.

Conclusion

iBiquity appreciates this opportunity to provide these views on the transition to digital broadcasting. iBiquity is prepared to supplement the record with any test data, system information or other information the Ministry may find useful.

Respectfully submitted,



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